

WE REVIEW TAMAYA'S NEW ASTUTE!

Radio Control CAR ACTION

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THE WORLD'S PREMIER R/C CAR MAGAZINE

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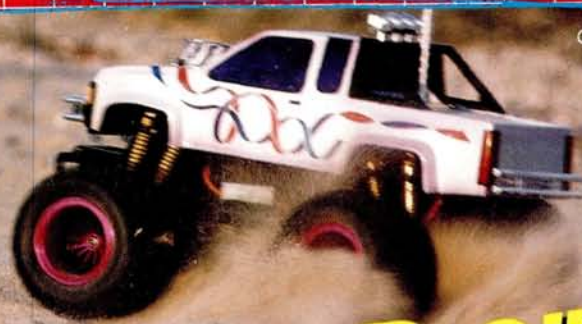
**WORLD
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TRUCK
PULLS**



**EAST-WEST
OVAL SHOOTOUT**
WHIPPOORWILL

SAMURAI SCOOTER

**ROYAL'S
NEW HONDA**



**PROJECT
DOUBLE
DARE**

**BUD'S
DYNO**

**RIPPIN'
RAMPAGE**

B E R Z E R K

**NEW!
WE SOLVE
YOUR
TECH PROBLEMS
(PAGE 97)**





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March 1990

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ON THE COVER: Center: The business end of Kyosho's nitro-powered Rampage (photo by Bill O'Brien). Inset: Frenzied pit action at Lake Whippoorwill (photo by Rich Hemstreet). Top Right: Tamiya's new 2WD off-road machine (photo by Steve Pond). Bottom: Royal's s-scale motorcycle (photo by "Smitty" Pond).

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EDITORIAL

by RICH HEMSTREET



CAR ACTION CONTINUES to lead the way in 1990. This month, we feature two major national events—the Third Annual Car Action Weekend at Lake Whippoorwill International Speedway and the World Championship Truck Pulls from Champaign, IL. I covered the high-banked action in Orlando, while Wally David was in the Midwest at the truck pulls.

For all you monster-truck fans out there, Bill O'Brien adapted a JG Optima Truck Conversion kit to the Kyosho RS 200 4WD rally car to make a nitro-powered crusher; Joe Bruni tricked-out a Double Dare in one of our continuing Project Series articles; and the Tamiya Mud Blaster hit the test track at the hands of Bill Henning.

Last month, we featured a preview of Tamiya's new Astute; this month, Jim Dahl has returned to do a full review on this new 2WD challenger. Also, while on the subject of Tamiya, I just heard that it has hired world-class British driver Jamie Booth to race its machines on the international scene. If Tamiya gets serious about building competitive off-road machines, it will be a force to reckon with.

Be sure to check out our new "Troubleshooting" column. We've changed the format to a question-and-answer style; so start sending in the technical questions that have you stumped.

I'm sure many of you have noticed the absence of the "Budget Racer" column in recent months. Its author Dick Brinton has undergone back surgery after a full-scale car accident and is temporarily out of commission. We hope Dick will be back at the track soon, and "Budget Racer" will return.

This month, we also review the Kyosho Rampage and the Royal Products 1/5-scale Honda Motorcycle. Both are outside the mainstream of the R/C car realm, as the Rampage is fuel-powered and the Honda obviously has only two wheels, but both are interesting and designed to be operated easily. "Bad Brain" O'Brien reviewed the Rampage, and "Ollie" David checked out the cycle.

Remember to stay in touch. As I said last month, we're making plans for our 1990 race coverage, so let us know about the major races you have planned. Next month's issue will be our Monster-Truck Special—don't miss it!

**MESSAGE FROM THE AYATOLLAH OF RADIO CONTROLLA:
ALWAYS PUSH TO REDLINE!**

LETTERS

WHERE TO WRITE TO US

If you're writing to the editors (and we'd love to hear from you), please be sure to address your letters to "Letters," *Radio Control Car Action*, 251 Danbury Road, Wilton, CT 06897. Only subscription orders and inquiries are handled by our Customer Service Department in Mount Morris, IL; other mail addressed there must be forwarded to Connecticut, which leads to long delays.

A Loud Roar

We were asked to publish this letter to the ROAR Executive Committee:

After much consideration, I've decided to quit the ROAR Body Approval Committee, as I feel it's a waste of time.

I attended two ROAR 1/10-Scale National Championship events in May and June, where all the body rules were thrown out the window or just ignored, for one or more favored manufacturers.

At one of the events, bodies that had been on the market for months were allowed, and the manufacturers had never

bothered to send them to ROAR for approval. This isn't fair to the manufacturers who have followed the system. More important, it isn't fair to the racers who weren't informed as to which bodies would or would not be allowed, as stated in the rules (15.17).

My years on the Body Committee have had highs and lows, but this new low point of dropping the rules at two National Championships is too much. My views are probably slanted because I work for a manufacturer, but the facts remain....

RICK JORDAN
Bolink R/C Cars, Inc.

Rick, it's always tough when you try to play by the rules and then the guy who

owns the ball changes them at the last minute. It's imperative for the future of R/C racing that all sanctioning bodies publish their rules well in advance and then stick to these rules for the duration of the events. Most of all, ROAR must learn that it doesn't actually "own the ball." Without the support of racers, no sanctioning body will last. When someone like Rick Jordan, who has been working with ROAR for a long time, decides to call it quits, it's time for ROAR members to take a look at what's going on and to demand some changes. RH

Approved Reading

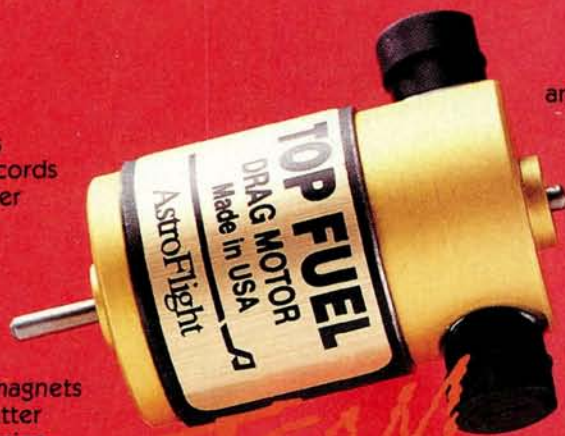
I want to thank you for a somewhat strange reason: your magazine is considered satisfactory reading material by my

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reading teacher. She allows me to write reports on articles in *Car Action!* Now my parents can't get mad at me for not doing my homework while I'm reading *Car Action*, because I am! Thank you!

I plan to buy a JR-X2 soon, and I'd like to know how the Losi H-arm modification affects the handling of the JR-X2. I'm also interested in dirt-oval racing, and I'd like to know which companies make lowering kits for the JR-X2. Again, I thank you!

JASON WASHBURN
Priest River, ID

Jason, I'm really glad that your teacher thinks so highly of *Car Action*. We try very hard to produce a top-notch publication, and our incredibly talented, highly moti-

vated, severely over-worked editorial department ensures that the articles are grammatically correct. Judging from your teacher's support of our magazine, it seems that the hard work has paid off!

Now, for your questions: Team Losi's Gil Losi Jr. explained that the H-arms for the rear suspension make the JR-X2 a more aggressive car. Although they make the car turn more quickly, they also make it more difficult to drive. The H-arm modification is designed for experienced racers who compete on well-groomed tracks. Gil added that if Team Losi were to show up at your local off-road track, they'd probably start out with the five-link suspension, because it's more stable on a bumpy track.

As far as I know, there are two oval

lowering kits for the JR-X2. We reviewed JG Manufacturing's kit in the August '89 issue, and Bolink also makes one.

WD

No Such Luck

Does anyone make a ball diff for the Tamiya Falcon? Thanks for any help you can give. Your mag is the best!

ANTHONY KOBIK
Belchertown, MA

Anthony, I haven't found anyone who makes a ball diff for the Falcon. I was told by the people at Thorp Manufacturing that the Falcon diff would be a difficult one to make, but they think that it was one of the better diffs of all the Tamiya cars.

(Continued on page 10)

POWER MONSTER

Power is the only thing Monster trucks understand. Team Astro speaks their language. Ten super power cobalt magnets, a skewed seven slotature, twelve turns of 22 gauge wire, an oversized commutator, oversized brushes, and adjustable timing. They all spell FULL PULL POWER.

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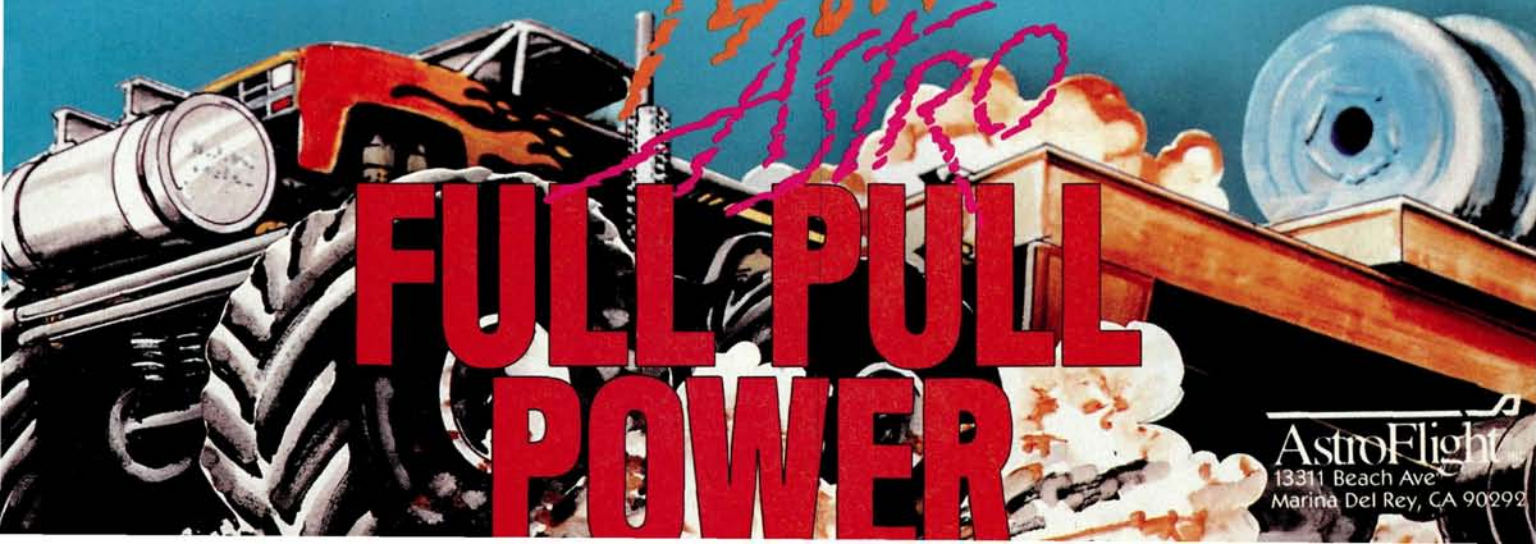
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LETTERS

(Continued from page 9)

Thorpe does make a dogbone/axle set that strengthens the drive system.

WD

Parked Between a Rock and a Hard Place

I think your magazine is tops! I own a Blackfoot named "Beetle Juice" that's equipped with a Hot Trick Frame, Kyosho Shocks, Track Master Belt Drive and Lexan Beetle body. After stomping the competition on its maiden voyage at the track, the owner of the track told me that I now have to run in a "conversion class." Why? This isn't fair! Now I have to run against JR-X2s, Ultimas and RC10s with fat tires. I bought all the parts for my truck from this same track; now I'm banned from the class for which I built the truck!

Is it just me, or does this sound like prejudice against the fast, well-built trucks? It was a Blackfoot; it is a Blackfoot; it will always be a Blackfoot!

J.D.

Chebance, IL

J.D., your letter caused a real verbal brawl between Smitty and me. I think that you should be allowed to race your killer truck, at least for the season. Unless there were existing rules against the mods you made, I don't think they should be able to legislate against you and make you run against conversions. It might be better to create a class for box-stock trucks next season. Part of the fun of racing is modifying your car or truck.

Because beginners will become frustrated if they have to race against radically altered vehicles like yours, I really think that some changes must be made to the classes. There should be a production class for plastic-chassis cars with mechanical speed controls and ROAR-legal stock motors. Here's a twist: cars in the stock class must use the gearbox that comes with the car. Anything else on the car may be changed, but the car must use a ROAR-legal stock motor. In the modified class, cars can use any tranny, but they must use a ROAR-legal modified motor; aside from that, anything goes!

These classes can be incorporated into existing rules.

The bottom line is that there must be enough classes available for everyone to race; but I'm not in favor of vehicles being banned mid-season!

W

No Corrections Made

I get your magazine every month, and I think it's the greatest. In the Kyosho Maxxum Track Report (August '89), you said the instruction manual had a few mistakes. Has Kyosho fixed them?

COLLIN MURPHY

Castle Rock, W

Collin, I checked with Great Planes about the instructions and was told there had been no changes. Furthermore, the Maxxum has been discontinued because there's no class in which to race it. It isn't allowed in the 2WD class, and it isn't competitive against the 4WD cars.

W

Getting Belted

I think it's great that I can write to you and find out things that I could never find without your help. I love your magazines. They're all great, and have lots of stunning pictures. Looks are tempting, but as a serious racer, I want the stuff that really works.

I'd really appreciate more information on Track Master's Turbo-Glide Belt-Drive Transmission. Is it as good as the Hyperdrive system for the RC10? Can you use the Hyperdrive system on the Turbo Ultima?

STEVEN VASCELLARO

Brentwood, N

Steve, thanks for the compliments! I'm surprised you haven't run across some of the articles we've done on these items. The Hyperdrive belt-drive system goes on the existing transmission in place of the normal pinion and spur gear. It doesn't do away with the transmission. The Turbo-Glide Belt-Drive Transmission from Track Master replaces the RC10's stock

PUBLISHER'S PAGE

by LOUIS V. DeFRANCESCO, JR.

transmission. A belt runs from a sprocket to a pulley; the pulley is then connected to a shaft on which the spur gear rides.

Hyperdrive makes a belt system for the Turbo Ultima that does away with the idler gear, as well as the pinion and spur; this makes the stock transmission more efficient. WD

Network News

Is there a way we can get ESPN (the sports network) to broadcast major R/C races?

JASON "RACING" LEININGER
Dillsburg, PA

Jason, that's a question I hear quite often. It's hard to believe that ESPN wouldn't be interested in R/C racing if it were presented to them in the proper way. Compared with some of the shows presently carried by ESPN (e.g., Clay-Target Shooting), scale auto racing would be far more exciting to more viewers.

RH

Silent Majority? Doubtful!

I read Andrew Zoltan's letter about the lack of coverage for 1/8-scale gas racing. Your answer to Andrew was correct—as far as it went.

Car Action sent me a copy of its Reader Survey, which was quite interesting. However, you didn't take into consideration that with no 1/8-scale gas coverage, 1/8-scale gas racers have no reason to read your magazine! If they don't read it, they don't see your Reader Survey, and guess what? You get low percentages.

Isn't it amazing how no coverage equals no reader, which equals no response, which equals the erroneous assumption that there's no activity?!

Most of the 1/8-scale on-road gas racers read *R/C News* because it seems to be the only publication that cares enough to give us coverage. Yes, I know that other publications give occasional coverage to major events, but that's about all.

JOE SULLIVAN
Dallas, TX

(Continued on page 20)



Ken McDowel (left), president and founder of Parma International, poses with publisher Louis DeFrancesco in front of Ken's Lamborghini Countach. Ken is one of the true pioneers of the R/C car hobby, and he's also a collector of many exotic cars. Yes, he let me drive the Countach!

The next decade...

By the time you read this, 1990 will be upon us and, of course, a new decade. I often think about the future of this hobby and the direction in which it's headed. Most of us on the trade side of the industry—manufacturers, distributors, publishers, mail-order companies, etc.—are very much preoccupied with growth, the challenge from competitors and gaining an increased market share (capitalism at work, if you will).

The mid-'80s brought an R/C "explosion," and hundreds of companies (mine included) experienced unprecedented growth. For this hobby to continue its growth in the '90s, however, the collective energy of the industry must be harnessed so that the word can be spread to the thousands of potential hobbyists.

There are so many other youth hobbies competing for our free time—everything from Nintendo to BMX. These other hobbies are great, but so is radio control, and the industry must be aggressive and compete for its share of the overall leisure-time hobby market.

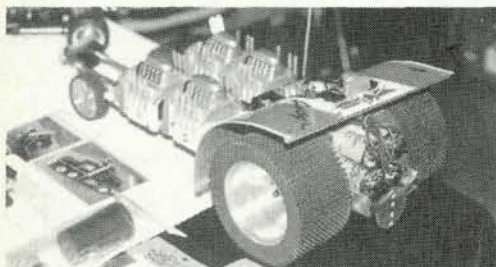
We at *Car Action* will be getting involved with more full-scale events like hot-rod and "exotic" car shows (like we did with the RG Canning shows last year on the West Coast). We also have many more races planned and will be dramatically boosting our marketing efforts on many fronts. I can't speak for everyone involved in the industry, but one thing is for certain: I'm dug in and plan to be here for a long time. I hope the rest of the industry follows suit. See you in the year 2,000! ■

TRUCK STOP

by DAVE SPROUL



Degree's 1/4-scale 4x4 puller has two engines and uses a chain drive. The fiberglass Ford body is exceptionally well-detailed.



Racemaster's pulling-tractor prototype was on display at the Chicago Model Hobby Show. Some pre-production changes are in the works.



The 1/4-scale, 2WD White Rhino puller from Degree Manufacturing uses a 21cc Echo engine and a Skellenger quick-change rear end.



A custom-painted, yellow-and-white Double Dare Nissan body sits on what looks like a Fine Design funny-car chassis. Is this a radical drag truck, or what?!



This Bruiser-based fire truck's many realistic details include a working light bar! The chassis seems to be stock.

JUST WHEN YOU THINK you've covered all the bases, you find that you've forgotten something, the facts have changed, or maybe it's "brain fade!" In any case, I need to make a few corrections to January's "Truck Stop."

First, when listing the available 1/10-scale pullers, I inadvertently omitted Bennett Equipment's* Pro-Puller I and II and XL 2WD kits, as well as its non-production, custom-built 4WD chassis. Contact Bennett for details and pricing.

Second, the Design 1 1/4-scale pulling trucks are now marketed by Degree Manufacturing*. I'm also told that the 1/4-scale monster truck pictured in the last issue of *Car Action* isn't for sale. It's a one-off prototype, which Degree hasn't yet decided to market, owing to the cost of production. Contact Degree Manufacturing for more information on its 2WD and 4WD 1/4-scale pulling trucks and 1/4-scale sled.

I hope everything's cleared up now! Maybe this month my "brain fade" won't be as bad!

I recently attended the Chicago Model Hobby Show and checked out some new products. Of special interest was Parma's* long-wheelbase '90 Chevy Silverado Lexan body, which can be used on stretched 2WD pullers or six-wheel monster trucks. The details are very good. Advance Engineering's* Full-Pull II 2WD puller chassis was also on exhibit. Parma and Racemaster* both displayed 2WD puller prototypes, and MRP* had a "wheelie machine," which, I understand, will be produced as a puller. Also new is Imex Model Company's* truck-pull tire to fit Clod Buster rims. It should be popular.

For you monster tank fans, the Kyosho* Blizzard snow cat has been re-released in the U.S. The snow blade is now standard, and the tracks are made of a more durable material to resist cracking in cold weather. With a few modifications, this could be a very quick monster-tank racer. Watch for a how-to article in the near future!

I also visited the show's static display area. There were few entries, but some very interesting ones. My favorites were the Nissan drag truck and the Bruiser-based fire truck, both of which show incredible attention to detail. I couldn't locate the owners, but I did steal a couple of photos. Very nice stuff!

Speaking of nice stuff, if you attended the NR/CTPA World Championship R/C Truck Pull and Monster Truck Competition back in October, you saw some of the most innovative machines imaginable! The truck pullers and monster truckers are leading the way in scale realism and detail. I'd like to see them set trends in other R/C areas as well.

The World Championships attracted 193 trucks from the U.S., Canada and New Zealand. The 2WD Open II Class pull-offs ended with an incredible 350-pound sled! Next time in "Truck Stop," I'll talk about sled weights and their effect on the sport.

That's all for now, folks! Put the hammer down, and I'll catch you on the flip-flop!

*Here are the addresses of the companies mentioned in this article:

Bennett Equipment, 900 E. 1300 S., Romney, IN 47981-9619.

Degree Manufacturing, 8614 Argent St. #A, San-tee, CA 92071.

Parma International, Inc., 13927 Progress Pkwy., North Royalton, OH 44133.

Advance Engineering, P.O. Box 766, Woodland Park, CO 80866.

Race Master, 6721-A Alder Dr., Houston, TX 77081.

Model Racing Products, Inc. USA (MRP), 18676-142 Ave. Northeast, Woodinville, WA 98072.

Imex Model Company, Inc., 53 Trade Zone Ct., Ronkonkoma, NY 11779.

Kyosho/Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.

READERS' RIDES

Welcome to Readers' Rides. This is our way of giving recognition to the unique, innovative—and sometimes bizarre—vehicles that our readers have created. If you want to join the growing ranks of Readers' Rides winners, send us a sharp, uncluttered, well-exposed color photo (no Polaroids, please!) of your car or truck, along with a brief description. Who knows? The Ayatollah of Radio Controlla might pick your car.

If your ride is chosen, you'll receive a one-year subscription to *Car Action*, or we'll extend your existing one. You'll also be eligible for the second annual "Readers' Ride Car of the Year Contest" in the fall of 1990. Send your photos to Readers' Rides, *R/C Car Action Magazine*, 251 Danbury Rd., Wilton, CT 06897. Be sure to include your address and phone number, in case we need to contact you!

sewing kit add realism to the Naugahyde bed-liner and bra. Since we used the photo, Michael doesn't have to take out the pins (his wife had threatened to repossess them!).

DIRTY HARRY

Harry Meikle, of Virginia Beach, VA, sent us this photo of his RC10, which is converted for dirt-oval racing. The driver's compartment seems to be bursting through the surface of the Associated Cougar body. Harry used a McAllister lowering kit to get the CompositeCraft graphite chassis nearer to the ground, and Andy's rear A-arms and a Novak speed controller complete the package. Harry has been racing for two years and says he really enjoys it. We enjoyed your seeing his ride, so we hope he'll enjoy his free subscription!



OUTLAW ON THE LOOSE

This red RACO 1/4-scale Outlaw is the work of Frank Dickerson of Pueblo, CO. It won 1st in Concours at the Colorado Super Speedway Championships, and it features RACO options, including: gold-anodized chassis; chrome wheels; K&N filter and B&L Goodyear racing tires. The rear control arms are milled aluminum from Outlaw R/C. The paint is

Deltron Porsche Red, and lettering and numbers were hand-painted by "Large." Thanks, Frank; we'd like to see more entries from other 1/4-scalers out there.

HONORED!

Twenty-five-year-old Michael Row of Silverdale, WA, said he'd be honored if we published this photo of his Ground Leveler—a modified Clod Buster. It sports a hand-cut, custom, aluminum-alloy chassis that lowers the truck by 1/2 inch and increases its wheelbase by almost 3 inches. The Leveler's body is made of polycarbonate, and a white "heartbeat" line accents the metallic burgundy. Pins from Michael's wife's



TRIBUTE TO TRICKLE

Quinn R. Sieber, of Eau Claire, WI, wanted to pay tribute to Dick Trickle, who's known as America's best stock-car driver, as he's won races in ASA, ARTGO and NASCAR competitions. A Bolink body and a "load" of Pactra paint and trim tape were used to make this replica of Trickle's Miller-sponsored ASA Camaro. Hats off to a great driver and a great Readers' Ride!



DIGGIN' IN

This shot comes from Ray Safaie, of Arcadia, CA. His RC10 is about to launch itself over a large mound of dirt. The Tekin 600 speed controller, 427 Speedworks motor and SCR batteries provide plenty of power for blasting around Southern California. Way to go, Ray!

HOT AND HANDMADE

These two sprinters—RC10s with Ascot conversion kits—come courtesy of Ray Haen of Sheboygan, WI. Ray *handmade* both bodies and wings out of .040 Kydex plastic on a homemade vacu-form using a vacuum cleaner and a portable electric heater. Each sprinter is equipped with a Novak speed controller and Imrex tires on Bru-Line wheels. The Folger Coffee Machine is outfitted with a Trinity modified motor and a 7-cell pack, while the Turtle Wax car has a 6-cell Gonzo SCR pack and a Speedworks 427. It looks as if Ray could have a successful career making bodies if he wanted to. We'll take one of each!



CAR GARDEN?

They don't grow on trees, but Brad Hood, of Beaumont, TX, has discovered the source of R/C cars—a barren patch of ground in his back yard.

As you can see, the '34 Ford on the ground has just broken the surface and hasn't yet grown wheels, while a Frog is emerging. A yellow Ultima is close behind a pink-and-white Ultima Pro. The blue Camaro on top must have mutated, as it has some Fine Design parts on its scratch-built chassis. The two Ultimas and the Camaro use Trinity Gold motors (as we're sure the Frog and '34 Ford will when they grow larger!).



CONCOURS CREATION

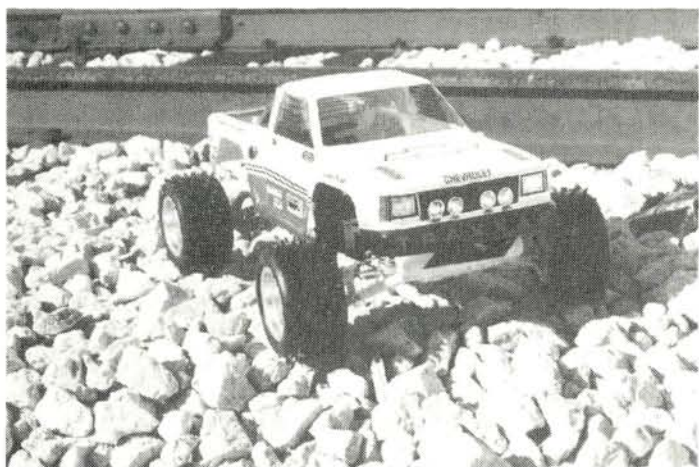
With this Andy's body, Eric Bourlet of Yelm, WA, won the Concours competition at the ROAR, Region 7, 1/10-scale On-Road Championship. Modeled after the '88 and '89 IMSA GTP Champion Electra-motive Nissan ZX-Turbo of Geoff Brabham, this racer has a Bolink Eliminator 10 Sport covered by an Associated 10L-like rear suspension. It has working headlights and taillights that operate off the Tekin speed controller; a Losi Revolution motor; a Novak receiver and an Airtronics CS2P. Sticking up behind the cockpit there's an air-intake scoop that was made using an old Mattel vacu-forming toy.



INSIDE SCOOP

by RICH HEMSTREET

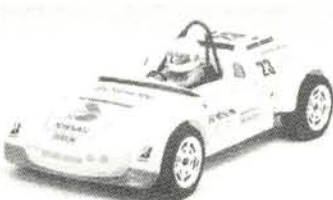
The R/C CAR industry is rapidly advancing, with new products being offered at a head-spinning rate. So, I'll make manufacturers nervous, but feed you R/C squirrels who are hungry for info, by bringing you a special report on security leaks and "late-in" items. Here goes!



THIS TRUCK IS MADE FOR RACING

Traxxas has a new truck designed for off-road racing. The truck doesn't have a name yet, but it does feature a graphite chassis, full ball bearings and graphite shock

towers. Aluminum, coil-over, oil-filled shocks will keep this truck hooked-up on the roughest track. Rumor has it the name may be the TRX-T.



ELECTRIC SPEC RACER?

The ugly-car-of-the-month award goes to this one-design racer from Japan. It's hard to say whether it's intended for on-road, off-road—or the unknown. This open cockpit racer is powered by a 6-cell battery pack. Apparently, the car races in the Saurus Cup series in Japan.

PROPER PAINT

Custom Colour is a new line of paint from Parma that's formulated to work on polycarbonate bodies. Fifteen colours (or "colors," to Americans) will be available when the paint first appears on the market sometime in March. For all you environmentalists out there (like Smitty, who only races his cars on carpet to avoid disturbing the topsoil), the propellant is ozone-friendly. The rest of us will have to stimulate the greenhouse effect some other way until there's outdoor racing year-round in Alaska.



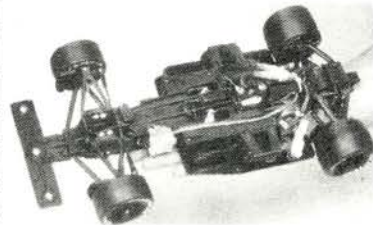
MAD CAP

Close on the heels of the As-tute is yet another new Tamiya 2WD off-roader—the Mad Cap. Catchy name,

eh? They might be better off sticking to initials—perhaps the MC-1? Reportedly, the Cap is an entry-level machine.

REEDY RACE OF CHAMPIONS AT WHIPPOORWILL

On March 3 and 4, Lake Whippoorwill International Speedway will host the Reedy Open and Race of Champions. Twenty-four top drivers will compete in the Race of Champions. In a special format, all the invitational class heats will earn points toward an overall championship. The Open portion of the program consists of stock and modified classes for amateur drivers.



ON-ROAD RACER ON THE WAY?

It looks as if Kyosho's 1/18-scale Formula cars have grown up! In Japan, there's now a pair of 1/10-scale on-road racers that feature fully independent suspension. The mid-mounted motor is actually in front of the rear tires. Two body styles are available: a Ferrari Formula 1 and a Nissan R89C GT racer. Is it possible that one of these will be Kyosho's long-awaited 1/10-scale on-road machine?



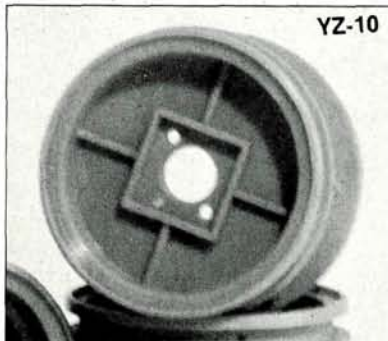
ORIENTAL-STYLE QUARTER-SCALE

Brand-new from Japan is this Renault 1/4-scale racer—apparently from MRE Corporation. The 25-pound car has fully independent suspension and foam racing slicks. At 340,000 yen, the price seems pretty steep. MRE should consider ripping the fenders off the Renault, lowering the roof, adding a wing and trying to run the car as a supermod over here.

SPEEDWORKS SPORTSMAN CUP TACKLES MEGATRAK

Trinity's first Sportsman Cup Series race will be held at the Megatrak Super Speedway in Browns Mills, NJ, on April 13 through 15. Amateur class in 1/12 and 1/10 scale will be contested. A group of expert drivers will be on hand to hold seminars and compete for bragging rights.

JG'S BOLT-ON ADVANTAGE



YZ-10

DIRECT BOLT-ON MONSTER TRUCK RIMS

These "new" dyable nylon rims are ultra lightweight for less unsprung weight. Front rims use stock bearings and axle nuts, rear rims use stock axle nuts. Booth front and rear rims are ribbed across back for super strength.

- 1453 RC-10 Front Nylon Direct Bolt on Rims.
- 1454 RC-10 Rear Nylon Direct Bolt on Rims.
- 1455 Kyosho Front Nylon Direct Bolt on Rims.
- 1456 Kyosho Rear Nylon Direct Bolt on Rims.
- 1457 YZ-10 Front Nylon Direct Bolt on Rims.
- 1458 JRX2 Front Nylon Direct Bolt on Rims.
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Set of Two: \$6.95

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LETTERS

(Continued from page 11)

Joe, your logic would be commendable if $1/8$ -scale racing was totally exclusive of all other forms of racing; however, every person I know who's involved in $1/8$ -scale on-road gas racing is also involved in other aspects of R/C racing. Our Reader Survey was the ideal place for these $1/8$ -scale "crossover" racers to show their numbers, and they did—with their 1-percent response.

Although I'm sure we missed a few gas-racing "purists," the numbers just don't warrant a great deal more coverage. From our survey results, I even dare to say that most R/C News readers also read Car Action, but it doesn't appear that a large number of "missing" $1/8$ -scale racers are to be found.

We expect to cover some $1/8$ -scale events this summer, but our primary intent is to cover that side of our sport for the many R/C enthusiasts who aren't involved in it, not strictly for the dedicated "purists."

RH

Pack Problems?

I'm 13 years old and I've been into R/C cars for about a year; I have a Hornet and a Midnight Pumpkin. I have a question: can you use battery packs in an on-road car, or do you have to use unassembled batteries?

CRAIG VETTORI
Newark, DE

Craig, in the past, many competitive on-road cars used saddle packs that had to be assembled from separate cells. Now, however, some competitive cars can use a stick pack as well as a saddle pack. If making the battery packs is your problem, there's a solution for that. A number of companies sell pre-assembled saddle-pack batteries in 4-, 6-, or 7-cell configurations.

SP

Puzzling Statistics

I was very impressed with John Faucett's $1/8$ -scale rail, which appeared in the January '90 issue. I can really appreciate all

the time and effort involved in such a project. What puzzles me are the statistics listed on page 88. Why would you want a 29-inch wheelbase on a 42.5-inch dragster? The photos on page 86 suggest a much longer wheelbase. What's up?

CRAIG O'NEAL
Alamogordo, NM

Craig, 29 inches is the correct wheelbase, and a length of 42.5 inches isn't all that unusual. The reason for the vast difference between the length and the wheelbase is the amount of hardware ahead of the front wheels and the length of the rear wing.

SP

Nitro Nonsense

I think your magazine is the best. I have to ask you a question concerning the December '89 issue and the Nitro Nationals. How fast are those gas-powered funny cars going? Which car won and how fast was it in mph? I think they went at no more than 70mph, but my friend thinks that they went at more than 100mph. I disagree, because the article said one of the dragsters was going 65.1mph, so none of them could have been going 100mph. He doesn't believe me. One more thing: those gas funny cars looked fast, but what's the fastest gas car in the world? Thanks.

KEVIN LOZADA

Kevin, I'll tell you from first-hand experience: these dragsters don't do 100mph in 330 feet (regulation $1/4$ -scale quarter-mile), but they will approach 100mph, given a greater distance over which to travel. In racing, though, it's rare to see these cars break 70mph. As far as I know, the fastest gas-powered R/C car was clocked at close to 90mph back in the early '80s. MRP ran one of its Pro 180 $1/8$ -scale pan cars on the front stretch of the old Ontario Motor Speedway in California.

This past summer, there was supposed to be a gas-powered land-speed record competition in France, but we never heard

NEW PRODUCT RELEASE

BRP PowerGlide



FEATURES:

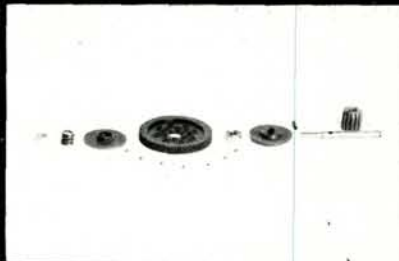
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5000 RC-10 Trans
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Ball Slipper Clutches



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any results.

Just for your information the fastest gas-powered model car in the world is a tether car that recently set the world record at just over 197mph! The tether cars aren't radio-controlled; they're attached to a heavy-duty cable and run in a circle. They look very much like the streamliner cars seen at the salt flats. To break the record, this particular car used a .61-cubic-inch nitro-burning model engine.

SP

An Astute Reader

I've just finished "transforming" my RC10 into a puller, so I'm thinking about getting a new 2WD off-roader. I had decided on either the Graphite RC10 or JR-X2. Then I saw it! Hanging on the wall in my local hobby shop was an Astute! This is one of the nicest-looking cars I've seen in a while. I wrote to correct the info in January's "Inside Scoop." The Astute doesn't come with a graphite chassis, but a black fiberglass chassis; and I'm afraid it doesn't come with metal shocks, but plastic oil-filled shocks. It does, however, come with a ball diff, sealed bearings for the gearbox and a protective chassis pan, which keeps out dirt. I hope this sheds some light on it.

BRIAN BECK
Bargersville, IN

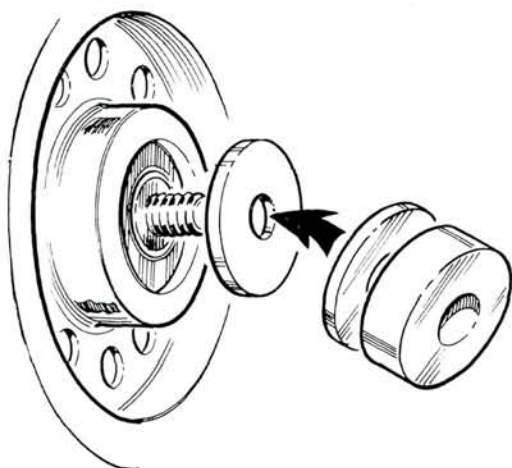
Brian, thanks for pointing out these mistakes. At the time we received the information about the Astute, it had just become available in Japan, and as you can see, a little can get lost in the translation from half way around the world. These mistakes were obvious to us when we had a kit in the office to review it. For a better look at the Astute, check Jim Dahl's review in this issue!

SP

We welcome your comments and suggestions. Letters should be addressed to "Letters," Radio Control Car Action, 251 Danbury Road, Wilton, CT 06897. Letters may be edited for clarity and brevity. We regret that, due to the tremendous number of letters we receive, we cannot respond to every one.

PIT TIPS

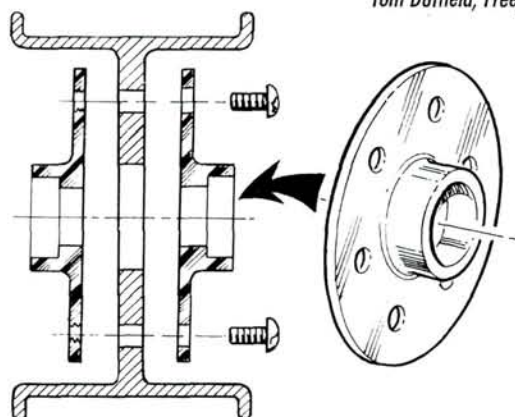
by JIM NEWMAN



NYLON DIRT SEALS

Our contributor always replaces his new vehicles' nylon wheel bushings with ball bearings. He puts the old bushings to good use, though; he places a slice of bushing on top of each ball race before he adds the retaining washer and nut. These nylon "washers" act as an extra barrier so protecting the bearings against dirt.

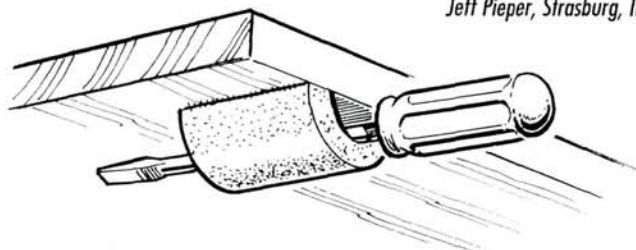
Tom Duffield, Freeport, IL



LOW-COST WHEEL REPAIR

Jeff abused his Blackfoot so much that the front wheels fractured around the hubs. He bored out the wheel centers and bought scrap aluminum 3 inches in diameter, a dozen 4-40 screws and a tap. He then turned new wheel centers, screwed them into each side of the bored-out plastic wheels, and was back in the game for under \$10! If you have access to a lathe, this certainly beats paying \$35 for a pair for new wheels—and it looks sharp too!

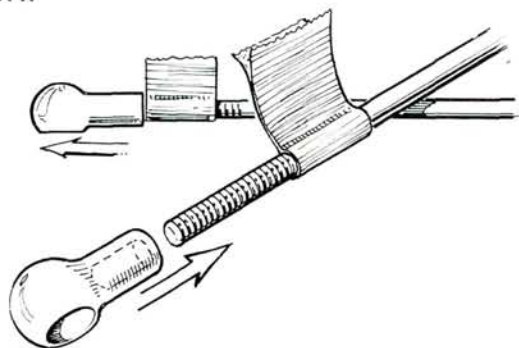
Jeff Pieper, Strasburg, IL



MAGNETIC SCREWDRIVER RACK

Before junking a burned-out motor, remove the magnets and glue them under a handy shelf. Screwdrivers stored between them will become magnetized, and they'll hold screws while you work on your cars.

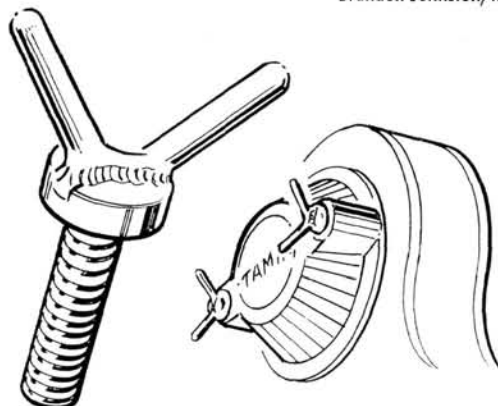
Jason Hudak, Hammondsport, NY



TRACKSIDE STEERING ALIGNMENT

If you have to change a ball joint, be sure not to disturb the steering alignment. First, put a piece of adhesive tape around the track rod against the ball joint. When you screw on the new ball joint, stop at the tape, and it will be in exactly the same place as the one you removed. The alignment isn't disturbed, and time is saved.

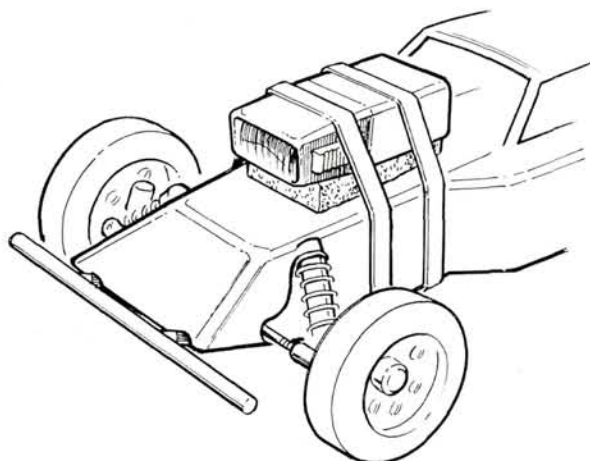
Brandon Johnston, Mayville, NY



THUMBSCREWS FOR GEAR COVERS

On the Tamiya Brat, two Phillips-head screws retain the motor and pinion cover; with repeated use, their X-slots wear out. When this happens, bend a 3/4-inch piece of music wire and solder it into the screw slots to make handy thumbscrews that don't need a screwdriver.

Paul Gabor, Bright, Ontario, Canada



QUICK-FIX HEADLIGHT

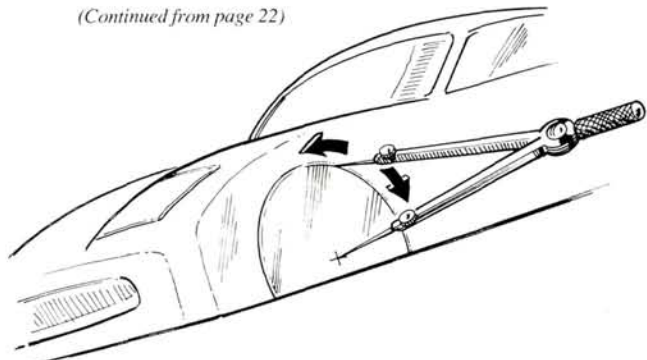
For after-dark motoring, Chad devised this temporary headlight—a small flashlight taped to the hood. A piece of foam might be needed to correct the light's aim.

Chad Keifer, Homer, MI

(Continued on page 24)

PIT TIPS

(Continued from page 22)



CUTTING WHEEL ARCHES

On a new body, mark the ride center of each wheel, then twirl a pair of dividers, as shown, to deeply scribe the wheel arch. When you've made a deep groove, flex the body to snap out the scored plastic cleanly.

Scott Sommer, Dalton, OH



BUBBLING BEARING CLEANER

Here's an ingenious bearing cleaner. Immerse your dirty bearings in a suitable container of solvent, and attach it to a fish-tank pump. The air bubbles will agitate the cleaning solution, and the bearings will literally have the dirt shaken out of them!

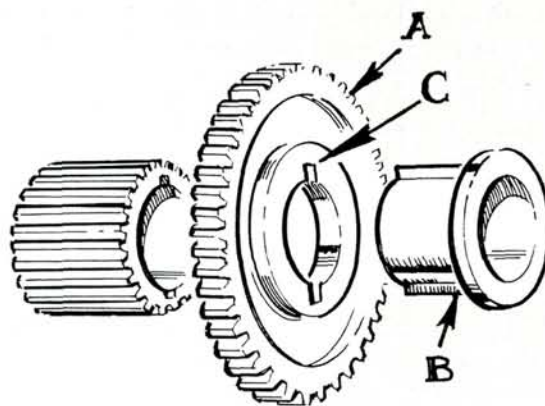
Bill and Bob Eacret, Wymore, NB



PARTS CAROUSEL

Small jars, with their lids secured under the four wooden arms of this invention, rotate on a piece of broom handle to bring supplies conveniently to hand. Why not put another one on top, using a length of threaded rod down through the center? Two levels will occupy the space of one.

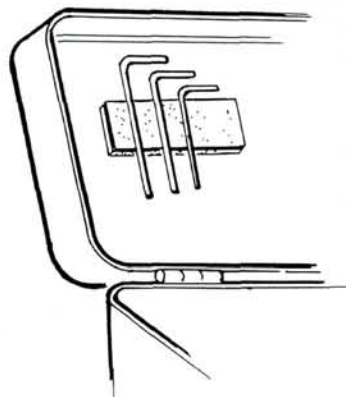
Chris Rogers, Bowling Green, KY



48-TOOTH GEARS FOR THE ULTIMA

Hold a Dirt Burner gear in a vise, and separate the large nylon gear from the smaller metal one, using socket wrenches as spacers. Replace the large spur gear (A) with a 48-tooth Robinson Racing gear, and retain it with the pressed-in collar (B). Slots must be cut in the new gear (C). Now you can take advantage of all the ratios this setup provides.

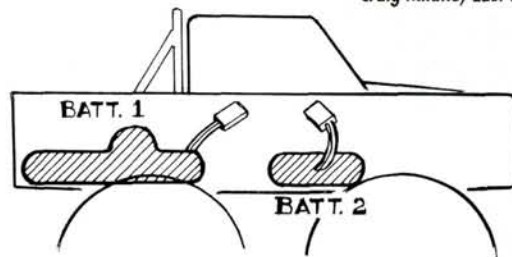
Robert Buchholz, Niagara Falls, NY



MAGNETIC ALLEN-WRENCH HOLDER

Stick a piece of Radio Shack's self-adhesive magnetic strip inside the lid of your toolbox to hold Allen keys, knife blades, washers, nuts and more.

Craig Milano, East Northport, NY



TO BATT. 1 TO BATT. 2 BEC

LONG-RUNNING CLOD BUSTER

Mike gets 20-minute runs out of his vehicle. He puts a regular 7.2V flat pack in the usual position and a hump-back pack with similar voltage in the rear of his truck. The two are joined in parallel with the Y-shaped cable adapter shown. The voltage is still 7.2, but the battery capacity has doubled. Charge each pack separately.

Mike Williams, Salinas, CA

Radio Control Car Action will give a free one-year subscription (or one-year renewal if you already subscribe) for each idea used in "Pit Tips." Send rough sketch to Jim Newman, c/o Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. Because of the number of ideas we receive, we cannot acknowledge each one, nor can we return unused material.

ram·page
(rām'pāj') n.

A course
of violent,
frenzied
action or
behavior.

—intr.v.

(rām-pāj').

-paged,

-pag-ing,

-pag-es.

To move
about

wildly or
violently.

[Sc., poss.
◁ RAMP2.]

TRACK REPORT



IF YOU'RE TOTALLY fed up with running for only four minutes and then waiting for 20 minutes while your batteries recharge, Kyosho's* new, gas, 2WD, mid-engine, glow-powered buggy may be your

ticket to ride.

The Kit

Designed along the lines of Kyosho's 1/8-scale 4WD Burns, the Rampage GP-10 is a racer's dream in a 2WD 1/10-scale package.

Power comes from an O.S.* .12 CZ-R, which is the top of the O.S. line—it's a high-revving engine for 1/10-scale cars. Tacked onto

the back of this engine is a recoil starter with T-handle that adds no more than 6 ounces to the car's weight and eliminates the need for about 25 pounds of other gear you'd otherwise need at the track.

Kyosho supplies a battery holder that fits the four D-cells (not supplied) used to fire the glow plug, which is included and already installed in the engine. There's also a gas bottle: fill it with glow fuel, cap it with the included metal spout/stopper, and you're carrying four tanks full of fuel in-





by BILL O'BRIEN

RAMPA

stead of a hefty gallon jug.

The car's layout is fairly straightforward. The chassis is an aluminum plate, and the differential is mounted, fully enclosed, at the rear. The

engine mounts amidships and turns a counter gear that's attached to a drive shaft. At the rear of the drive shaft there's a smaller drive gear that's joined to

the differential by a toothed belt.

Independently sprung lower A-arms hang from each corner and are held to a predetermined camber angle

(Continued on page 31)

IT'S
GAS!

RAMPAGE

(Continued from page 29)

by pre-formed solid rods that are attached to the shock towers. The suspension is traditional 2WD technology: the front shock towers protrude, and the assembled car bears a striking resemblance to an Ultima capped with a shrink-wrapped Burns body.

Assembly

Assembly looks easy, but looks can be deceiving. The CZ-R comes mounted on the chassis, as does the

receiver made it impossible to install the receiver battery pack where the manual said it should go. To my chagrin, it wouldn't fit anywhere else, either! I eventually made a custom pack from four 1/2 sub-C cells, and I wedged it into place, leaving just a small amount of chassis overhang.

Construction Delays!

I was puzzled by the shock absorbers: in some ads, these new black shocks are being touted as

Kyosho's "famous suspension." They seemed to be a little too soft for what I knew would be the powerful pull of the

Two primer pumps on the fuel tank prime the O.S. CZ-R engine. The needle valve next to the air cleaner is used to adjust the air/fuel ratio for optimum performance.

CZ-R.

There was also something that made me quite angry. It seems that the CZ-R wasn't Kyosho's first choice of engine for the Rampage—at least, I was forced to conclude that after I had almost completed the car.

With all the mechanical assembly completed and the body painted, I went for the plastic bag holding the great decals. That bag contained a smaller bag in which there was a note and two 5x10 bearings. Apparently, the power of the CZ-R led Kyosho to recommend that you replace the two bushings in the drive-shaft support housings with the bearings that were provided.

Unfortunately, this section of the car was assembled at the factory, and some disassembly was required before I could make this modification. On the brighter side, if you just remove the throttle servo, you can

(Continued on page 32)

KYOSHO

RAMPAGE

Type 2WD off-road racer
Scale 1/10
Sug. Retail Price \$359.95

DIMENSIONS:

Overall Length 14 inches
Width 9.25 inches
Height (without wing) 5.5 inches
Wheelbase 10.8 inches
Front Track 8 inches
Rear Track 8 inches

WEIGHT:

Gross (w/bat.) 3 pounds, 6 ounces

BODY:

Type Single-seater buggy
Material Polycarbonate

CHASSIS:

Type Plate
Material Aluminum

DRIVE TRAIN:

Primary Pinion/spur
Transmission ... Shaft-drive, centrifugal clutch
Engine O.S. .12 CZ-R with recoil starter
Differential Spider gear
Bearings/Bushings 2 bearings, metal bushings

SUSPENSION:

F/R: Type Lower A-arm with upper rod
Dampening ... Oil-filled, coil-over, left and right

WHEELS:

Front:
Type One-piece plastic
Dimensions (DxW) 2.125x.75 inches front
Rear:
Type One-piece plastic
Dimensions (DxW) 2.125x1.375 inches rear

TIRES:

Front/Rear: Pin-spiked

OPTIONS AS TESTED:

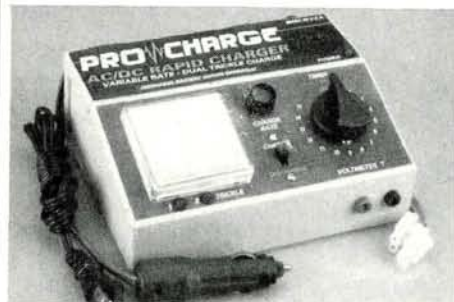
Fuel dispenser; glow plug; battery holder; and KO PROPO EX-5 radio system.

COMMENTS:

The Rampage is a hurricane waiting to happen. Several differences between the assembly manual and the car seem to indicate that the included O.S. CZ-R .12 engine wasn't the original choice for it. The engine easily overpowers the Rampage's road-handling ability if you have a lead finger. Barring that, it ranks right up on the scale with my 4WD Burns as being a car with which to grab the field and then dominate it. With a street price not much higher than the Optima Mid SE's, you might want to give the Rampage some serious consideration.

TWO CHARGERS IN ONE.

PROCHARGE



- One full-time trickle output
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- Timed discharge
- Automatic trickle charge after discharge
- Automatic trickle charge after fast charge
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- One indicator light for each power output
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- Accepts either 110VAC or 12VDC power output
- Voltmeter lead connection jacks
- Fuse protected output for protection from polarity reversing and shorting
- Limited 5-Year warranty
- All major components are U.S.A. made

10155 ProCharge model 1020

*DC Charging of 10 cells requires the battery to be under charge condition

ROCK BUSTER



The Original Rockbuster is a 1/10 scale electric off-road car which comes with a RS-380 motor. It has a 3 step forward/3 step reverse mechanical speed controller, rear differential, and soft rubber tires. It comes in kit and 95% pre-assembled form. 2 ch. radio and 7.2V hump pack required - not included.

Original Rockbuster

21331 - Kit • 21343 - 95% Assm.

The Hopped-Up Rockbuster is designed for competition. It has all the features of the Original, plus a heavy-duty rear suspension, adjustable oil-filled shocks, front torsion bar, RS-540 motor, and larger low-profile tires on gold colored rims.

Hopped-Up Rockbuster

21772 - Kit • 21719 - 95% Assm.

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8960 Rossash Road, Cincinnati, OH 45236

Phone: Orders only: 1-(800)-332-4359

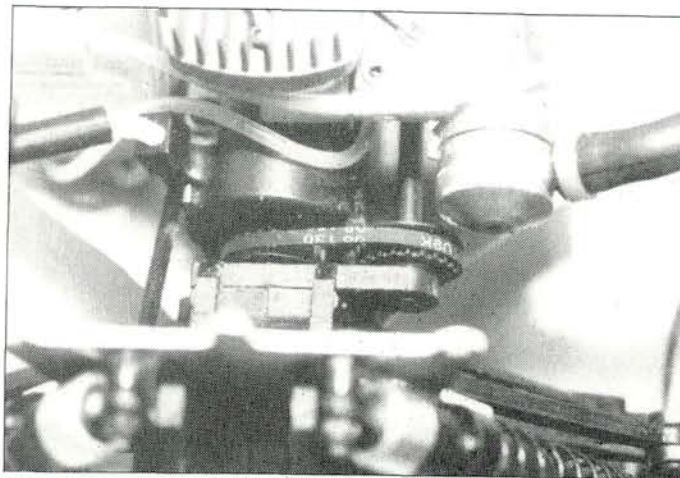
Info: (513) 793-5900 • Fax: (513) 793-7337

RAMPAGE

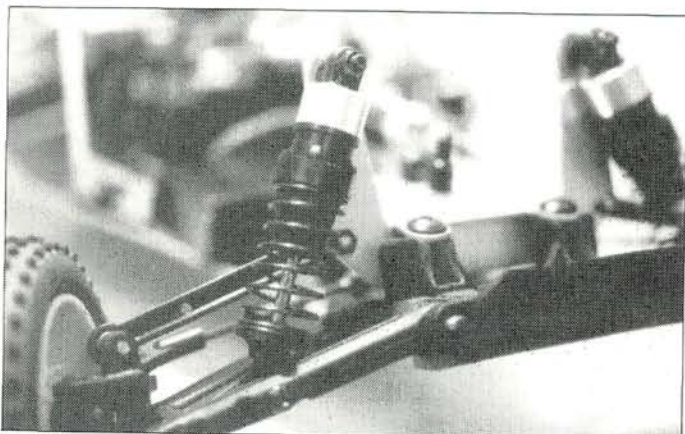
(Continued from page 31)

remove the drive shaft with just a little wiggling. (Note that the drive shaft is drilled at each end for a pin that holds the gears in place. The 5x10 bearings are a tough fit until you've guided them past this pilot hole. Have a rawhide or rubber hammer handy.)

At this time, pick up the four



The Rampage has a direct-drive gear on the front of the drive shaft, and it uses a belt and pulleys on the rear. Note the recoil pull-starter for easy starting.



The Rampage's unique shocks use a fiber-filled nylon body that's light and durable.

5x10 bearings you'll need for the rear wheels and the four 4x8 bearings that fit the fronts. If your local hobby store doesn't sell loose bearings, buy a set for the Ultima. It will cost a little more because you'll also get a few diff bearings, but the Rampage's wheels need the help. (I haven't yet disassembled the diff to check the bearing situation.)

You should also open the rear

diff, and you can do this by removing a small access panel that's at the bottom of the chassis. Kyosho supplies a tube of grease, and this is a good place to use some of it. If you've stuck with the bushings, be sure to grease the rear spindles, too.

You'll see "screw cement" on the list of inclusions, and it's there for a reason. If you've ever had a

screw come loose on an electric car, you'll be able to imagine what would happen if you applied three times the horsepower. Use the cement on everything; in fact, you should remove the factory-installed screws one at a time, apply screw cement and then re-seat them. (It's better to do the work now than to lose a dogbone or a drive shaft later.)

I don't usually comment on the amount of preparation needed for a car's body, but here, too, Kyosho has done a note-

worthy job. One of the major dangers of glow engines is that they overheat because they're poorly ventilated. The Rampage body comes with the front and rear windcreens already open, and this gives plenty of air to the large CZ-R heat-sink head.

The antenna hole and the front and rear body-post holes have also

(Continued on page 90)

COMING NEXT MONTH! MONSTER TRUCK SPECIAL



FEATURES

Funny Car Puller
JG JR-X2 Truck Kit
Maximum Clod Buster

COMPETITION

U.S. Indoor Champs



TRACK REPORTS

Tamiya King Cab
Kyosho Raider ARR
Tamiya Pumpkin QD

COLUMNS

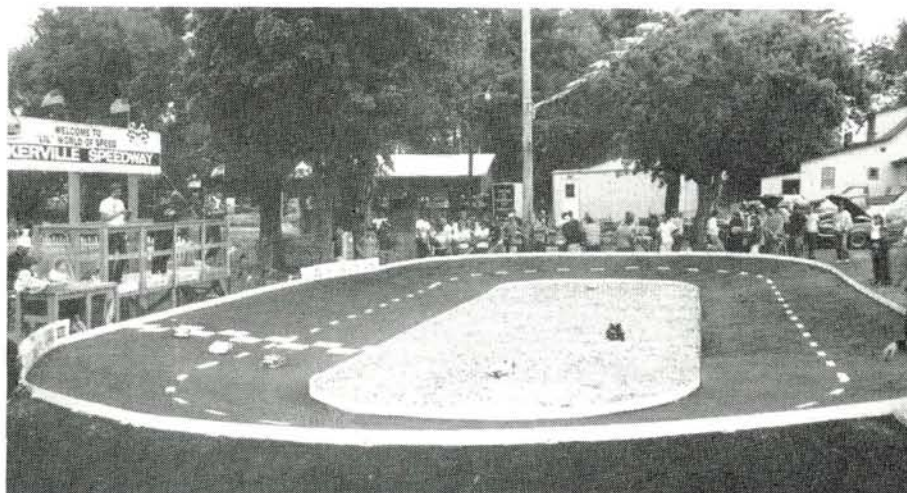
Dirt Digest
Troubleshooting
Truck Stop

BONUS

**Monster Truck Buyers'
Guide**

HOT TRACKS

Welcome to "Hot Tracks." Each month, we'll choose an outstanding track to feature in this column. To qualify, send in some high-quality, black-and-white photos of your track, along with a description (approximately 500 words), and tell us why your track should be chosen. Send your entries to Hot Tracks, Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897.



Bakerville Speedway Bakerville, Wisconsin

FREE FOOD AND DRINK—that's what owners Jerome and Shirley Lang gave workers for the one month and two nights it took to build their new R/C track. The free refreshments offer has expired, but you can still have a lot of fun and do some terrific racing at the Bakerville Speedway Li'l World of Speed in Bakerville, WI!

Jed Moore, of nearby Marshfield, designed this hot track, and you can be sure he included all the best features: he has been racing for eight years. The 1/10-scale, high-bank, black-top oval track was built for real competition. It's 70 feet long and 40 feet wide, with 15- to 20-degree banking and a 9-foot-wide infield.

Since the grand opening in July '89, as many as 42 drivers have sped over to catch all the action. For a little town,



that's a lot of excitement. R/C enthusiasts are zooming in from all over Wisconsin, it seems, and from Minnesota and Arkansas too!

Business has tripled so far. No wonder the Langs say, "This is incredible!" No wonder they hate to see winter set in! But the minute the snow thaws, you can bet they'll be racing again, every Tuesday night and Sunday afternoon.

For more information about one of central Wisconsin's newest R/C hot spots, contact: Jerome & Shirley's Country Bump Kin Saloon and Park, Li'l World of Speed, 10631 Hwy B, Marshfield, WI 54449. Tel: (715) 676-3768.

T H I R D A N N U A L

HITTING THE HIGH BANKS!

Radio Control
CAR ACTION

W E E K E N D

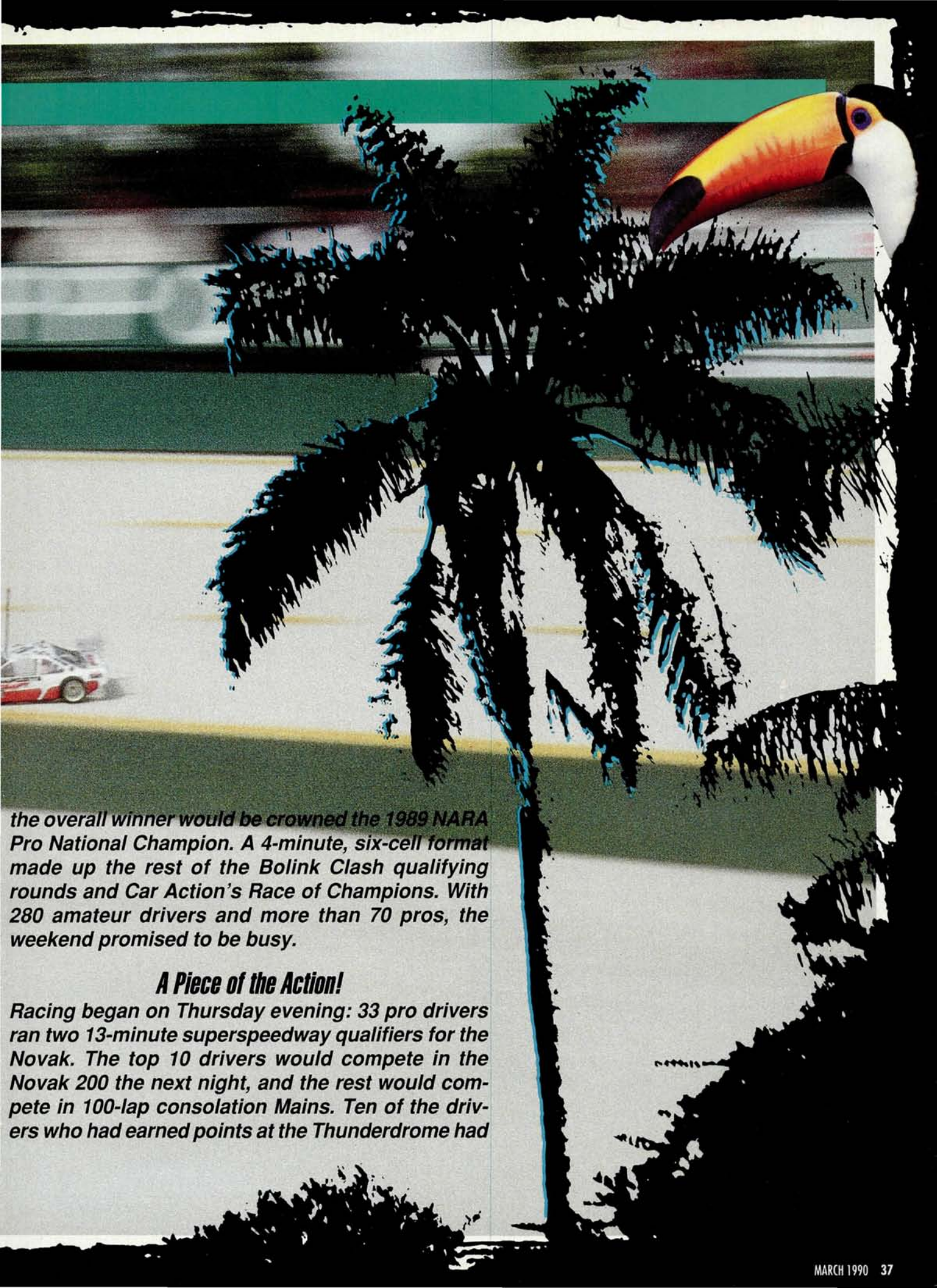
HOSTED BY **LAKE WHIPPOORWILL SPEEDWAY**

by RICH HEMSTREET



TO REALLY appreciate the great time we had at the Third Annual Car Action Weekend in mid October '89, you'd have to have been among the more than 350 racers who converged on Lake Whippoorwill International Speedway in Orlando, FL. What drew these drivers from all over the country?—even as far away as the West Coast. How do the Bolink Clash, the Acutrak Dash, the Novak 200 and the Race of Champions sound to you?

The two-race Car Action East-West Shootout had opened six weeks earlier at the RC Thunderdrome on the West Coast, and Friday night's Novak 200 would be the finale. The series featured a scaled-down NAS-CAR-style superspeedway format, and



the overall winner would be crowned the 1989 NARA Pro National Champion. A 4-minute, six-cell format made up the rest of the Bolink Clash qualifying rounds and Car Action's Race of Champions. With 280 amateur drivers and more than 70 pros, the weekend promised to be busy.

A Piece of the Action!

Racing began on Thursday evening: 33 pro drivers ran two 13-minute superspeedway qualifiers for the Novak. The top 10 drivers would compete in the Novak 200 the next night, and the rest would compete in 100-lap consolation Mains. Ten of the drivers who had earned points at the Thunderdrome had



Kent Clausen's Tide Car didn't win Concours, but it sure was easy to spot on the track.



The Primo Beer car won the McAllister Best Paint Concours for Karl S. man.

come to Orlando, hoping to win both the Car Action East-West Shootout Championship and the NARA title.

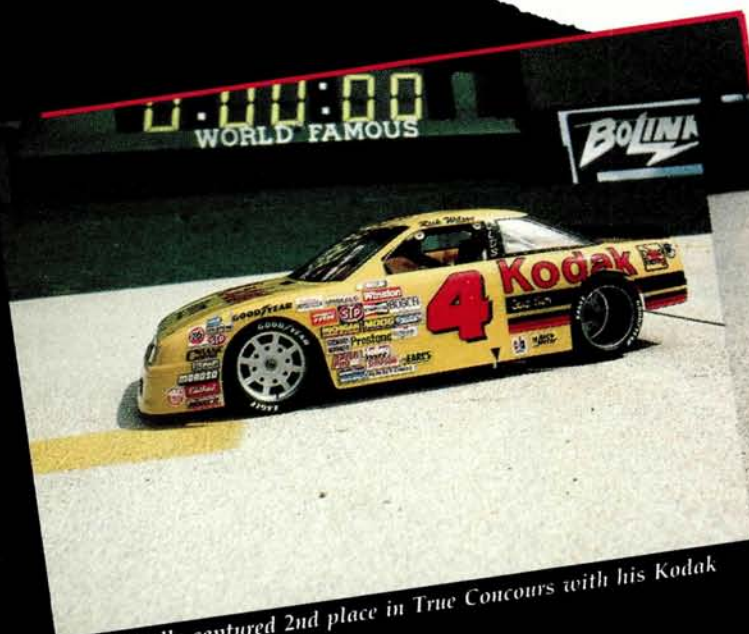
• **Novak pro qualifying:** After the first round, Jim Fuller, driving the Redline/Composite Craft Lynx II car, was the top qualifier with 117 laps in 13 minutes, and Associated/Reedy-sponsored Kent Clausen was 2nd with 113 laps. Clausen drove an Associated 10L with a Probe Enterprises quick-change conversion chassis, which had a unique, integrated, grid antenna laminated to the bottom. Driving the Pro Proven Products Lynx II, Bill Horne was 3rd.

In the second round of qualifying, Chris Doseck drove his Composite Craft/CAM-sponsored Lynx II 123 laps in 13 minutes to win the pole position for the Novak. Driving a Bolink Eliminator spon-

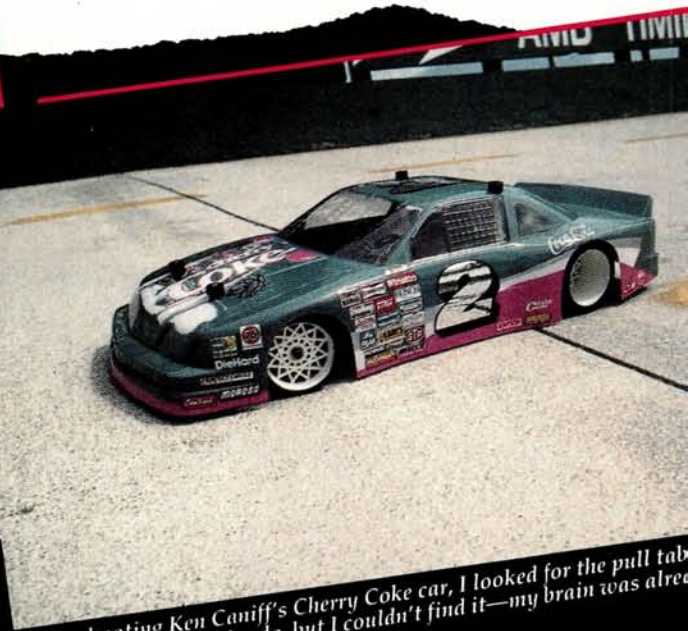
sored by Bud's Racing/CAM, Bud Bartos earned the second starting position with a 117-lap run. Tony Neisinger, with his Trinity/Composite Craft Lynx II, was third fastest, also with 117 laps. With the Novak field set, the pro drivers prepared for their 4-minute Bolink Clash qualifying, which was scheduled for all day Friday.

• **Bolink Clash qualifying:** Paul Davis, driving the Redline/Composite Craft Lynx II, turned 41 laps in the first round—an effort good enough to capture the TQ position. Andy Dobson completed 41 laps in his final qualifier, and this earned him the second starting position. Also with 41 laps in his final qualifier, Kim Davis was third fastest overall. (Davis and Dobson both drove Lynx IIs sponsored by Composite Craft/Redline.) Shawn Ireland qualified fourth by driving his Associated/Reedy 10L 40 laps.

• **Novak 200:** Rain caused several delays, but the super speedway racing finals eventually got under way on Friday night. Following the three lower 100-lap Mains, the top 1



Jeff Caudle captured 2nd place in True Concours with his Kodak Oldsmobile.



After shooting Ken Caniff's Cherry Coke car, I looked for the pull tab I could take a swig of soda, but I couldn't find it—my brain was already fried!



Left: Rich Casteline's Ritz Photo car took 3rd place in the Best Paint category.



Hyperdrive's Hyper 10 pace car had flashing headlights, tail-lights and light bar. It was used for rolling starts on all the superspeedway races, including the Novak 200.

pro drivers were all geared up for the Novak 200. Bob Novak drove the beautiful Hyper 10 pace car on the parade lap, and as he came around on the second lap (when the green flag would fly), several cars tangled. Nevertheless, the race must go on! The pace car pulled in, and the race was on.

The unlucky drivers whose cars had collided on the pace lap immediately found themselves a lap down. Ralph Burch pulled into the pits early, and his crew worked feverishly on his Hyperdrive/CAM Hyper 10. After only 95 laps, Clausen's 10L/Probe was nailed from behind while stationary on the track, and with his car damaged beyond repair, he retired from the race.

Doseck and Fuller hooked up in a race-long battle for the lead. At the checkered flag, Doseck was ahead by one lap, and he won the 200 driving his Composite Craft/CAM Lynx II.



Dan Toll's Concoits entry blew away the competition even while it was up on jack-stands. This car looked like a static model, but it was fully functional by radio control.

NOVAK 200

Fin	Qual	Name	Chassis	Motor	Speed Cont.	Tires	Batteries	Body Mfg.	Body Style	Sponsors
1	1	Chris Doseck	Comp. Craft	CAM	Novak	TRC	CAM	Bolink	Thunderbird	Comp. Craft/CAM
2	4	Jim Fuller	Comp. Craft	Redline	Novak	TRC	Redline	Bolink	Thunderbird	Redline/Comp. Craft
3	6	Terry Rott	Comp. Craft	CAM	Novak	TRC	CAM	Bolink	Thunderbird	Comp. Craft/CAM
4	3	Tony Neisinger	Comp. Craft	Trinity	Novak	TRC	Trinity Pushed	Andy's	Thunderbird	Trinity/Comp. Craft
5	10	Mike McBride	McAllister	Black Magic	Novak	TRC	Team Smooth	McAllister	Thunderbird	Team Smooth/McAllister
6	7	Tim Lanier	Bolink	CAM	Novak	Bolink	Gonzo	Bolink	Thunderbird	Bolink/CAM
7	2	Bud Bartos	Bolink	CAM	Novak	CKW/TRC	Power Push	Bolink	Thunderbird	Bud's Racing/CAM
8	9	Bob Sumner	Hyperdrive	B&R	Novak	TRC/Dearth	Sanyo	McAllister	Lumina	Hyperdrive/B&R
9	8	Kent Clausen	Assoc./Probe	Reedy	Novak	TRC	Reedy	Associated	Lumina	Associated/Reedy
10	5	Ralph Burch Jr.	Hyperdrive	CAM	Novak	Wide Track	Sanyo	McAllister	Thunderbird	Hyperdrive/CAM

EAST-WEST High Fanked OVAL SHOOTOUT

"THE LEGEND" RETURNS

CAR ACTION SPONSORED the two-race East-West Shootout for professional R/C racers. The Shootout opened out West at the RC Thunderdrome, and the finale was the Novak 200 at Lake Whippoorwill International Speedway in Florida.

The East-West series featured superspeedway racing. Pit stops for batteries were needed, as the drivers went beyond the usual 4-minute limit, and each driver had a two-person pit crew and a spotter to help him during races. Out West, drivers ran 14-minute qualifiers and 23-minute Mains; at Whippoorwill, they ran 13-minute qualifiers and a 200-lap A-Main—the Novak. The lower Mains at Whippoorwill each ran 100 laps.

Ralph Burch Jr. won the Thunderdrome race by driving his Hyperdrive/Futaba Hyper 10 108 laps in 23 minutes. TQ Snuffy Smith finished a lap behind Burch with his Hyperdrive/CAM Hyper 10, but he led by one series point going into Whippoorwill. Rick Pruitt, driving the McAllister/Revtech Outlaw, finished 3rd.

QUALIFIER CONTROVERSY!

When it was announced that cars would be limited to three 6-cell battery packs in the qualifiers, tempers began to flare. Having been allowed to run an unlimited number of 7-cell packs at the Thunderdrome, many teams were upset by the new rule.

The 6-cell rule was implemented in the name of safety—to slow the cars. The three-pack limit was supposed to save the teams money, but it in fact cost them more, because pit crews had to try to recharge hot battery packs during the race, and many good ones were destroyed.

Of the racers who checked in at the Car Action Weekend, 10 had raced at the Thunderdrome. The



Bud Bartos raked in the East-West Championship at Whippoorwill.



This battered Eliminator is the car Bud drove to the Championship, or did the Noid actually control the wheel?



points system was set up so that racers competing in both races would finish before the others, so it was obvious from the start that one of the 10 drivers would be the East-West Shootout Champion.

By the end of the second qualifying round, the series had become a two-man race. Bud Bartos and Ralph Burch Jr. were the only drivers in the Novak 200 who had a chance to win the Shootout and become the 1989 NARA Pro National Champion. Burch was "in the driver's seat," as Bartos had to finish at least three positions and eight laps ahead of him to win.

TIRESOME TROUBLES

Both drivers had problems in the Novak: Burch dropped out with electrical problems after only 31 laps; Bartos's Bolink Eliminator, (sponsored by Bud's Racing and CAM) blew a cap from one rear tire. The crew tried unsuccessfully to reglue it, but eventually had to pull the cap off and send Bartos out to run laps in an attempt to improve his position in the standings. It worked! Bartos finished in 7th place with 163 laps.

Bartos and Burch tied with 193 points, but Bartos had run 125 more laps in the combined Mains and, for this reason, he won the series. Bud Bartos—"The Legend of Whippoorwill"—won the Car Action East-West Shootout and the 1989 NARA Pro National Championship at the track that made him famous.

EAST-WEST SHOOTOUT Final Point Standings

1. Bud Bartos (264 laps) 193 points
2. Ralph Burch Jr. (139 laps) 193 points
3. Snuffy Smith (198 laps) 183 points
4. Tony Neisinger (191 laps) 183 points
5. Rick Pruitt (102 laps) 183 points
6. Bob Sumner 180 points
7. Randy Moller 176 points
8. Bill Horne 174 points
9. Rick Jordan 171 points
10. Steve Stifel 166 points



QUICK CASH! \$

TWENTY DRIVERS HAD a chance to earn a big return in a short time. The 10 fastest pro and the 10 fastest amateur qualifiers were invited to take part in the 2nd Annual Acutrak Dash—a 2-minute solo run against the clock. The driver with the most laps wins.



When all went well, battery changes took only 3 to 5 seconds for most crews.



Before each race, most drivers have somebody check the steering trim and throttle response after turning the car on.

With his Redline/Composite Craft Lynx II, Fuller finished 2nd; Terry Rott's Composite Craft/Cam Lynx II completed 197 laps to finish 3rd; and Tony Neisinger, who completed 186 laps with his Trinity/Composite Craft Lynx II, finished 4th.

● **Bolink Clash amateur qualifying:** On Saturday, the amateurs were allowed to show their stuff, and the top three qualifiers in each class were awarded trophies from Bolink.

The Amateur Stock Class drivers were given Speedworks Superspeedway Stock Motors, which were developed for NARA stock racing on high-speed ovals. In fact, with their Speedworks handout motors, the stock TQ drivers ran fast enough to have made the B-Main in the Modified Class!

It was close! John Walter, driving a Composite Craft car, became the stock TQ by completing 36 laps in 4:06.24. He barely beat Ricky Jordan who drove his Bolink LTO the same distance in 4:06.51; and Diane Rivers was the third-fastest qualifier, driving 35 laps with her PRC PR7.

In the Amateur Modified Class, Jan Limpach set the fastest time in his second qualifier. Driving an Associated 10L powered by a Reedy motor, Limpach just missed 38 laps with a 37-lap 4:00.35 run. Mark Johnson was second fastest, finishing just under 2 seconds behind Limpach with his Trinity-powered TRC Pro 10. Jill Simms qualified third, driving a CAM-powered Lynx II.

● **Acutrak Dash and Braun Hobby Dash for Cash:** These were run on Sunday morning. See the "Quick Cash" sidebar for the results.

Concours Quality

At noon on Sunday, McAllister Concours judging took place as the famous Whippoorwill Parade of Cars lined up on the track. Miss Whippoorwill, Kim Rule, was there to hand out the trophies for the Novak, the Bolink Clash and the Car Action East-West Shootout.

As usual, Concours at Whippoorwill wasn't for the ill-prepared. Dan Toll won the McAllister True Concours with an ultra-detailed Patty Moise Amway Freedom Fuel Additive number 45 car. Even



David Johnson, of the Marshal Browning Co. (maker of Acutrak watches), was on hand to present the prizes. The fastest pro and amateur drivers were each to receive a Tiffany gold ring.

In the amateur class, the third-fastest Bolink Clash qualifier came away with the victory. Jill Simms drove her CAM-powered Composite Craft car 21 laps in 2:01.69. Simms even finished ahead of three of the pro drivers! In the pro ranks, driving a Redline-powered Lynx II, Kim Davis completed 22 laps in 2:03.53 for the victory.

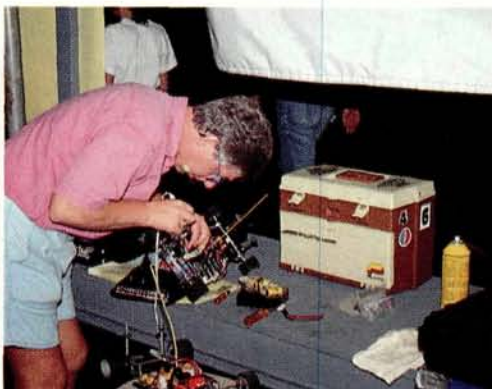


The top five finishers in each class then had the chance to run in the Braun Hobby "Dash for Cash." Once again, they completed 2-minute solo runs. The amateur drivers competed for a Braun Hobby gift certificate worth \$1,000, while the pros were shooting for a \$1,000 check from Braun Hobby Distributors.

Jill Simms backed up her Acutrak win with another 21-lap run, and that gave her a 1-lap victory over Mike Boylan. The pro drivers really liked the idea of bringing home some cold cash from Whippoorwill: four of the five turned 22 laps! Chris Doseck captured \$1,000 by driving a Lynx II powered by a CAM motor and pulling out a 2-second victory over Tony Neisinger.



The green flag is out for the start of Friday night's Novak 200.



Between heats, Gary McAllister was hard at work in the pits.



Above: High-speed oval-track racing provides lots of close racing.

Left: During the Parade of Cars, fans have an opportunity to walk on the track and see the cars up close.

PRO MODIFIED

Fin	Qual	Name	Chassis	Motor	Speed Cont.	Tires	Batteries	Body Mfg.	Body Style	Sponsors
1	1	Paul Davis	Comp. Craft	Redline	Novak	TRC	Redline	Bolink	Thunderbird	Redline/Comp. Craft
2	9	Chris Doseck	Comp. Craft	CAM	Novak	TRC	CAM	Bolink	Thunderbird	Comp. Craft/CAM
3	6	Kent Clausen	Associated	Reedy	Novak	TRC	Reedy	Associated	Lumina	Associated/Reedy
4	3	Kim Davis	Comp. Craft	Redline	Novak	TRC	Redline	Bolink	Thunderbird	Comp. Craft/Redline
5	2	Andy Dobson	Comp. Craft	Redline	Novak	TRC	Redline	Bolink	Thunderbird	Comp. Craft/Redline
6	10	Bob Light	Comp. Craft	Trinity	Novak	TRC	Trinity Pushed	Bolink	Thunderbird	Trinity/Comp. Craft
7	5	Tony Neisinger	Comp. Craft	Trinity	Novak	TRC	Trinity Pushed	Andy's	Thunderbird	Trinity/Comp. Craft
8	4	Shawn Ireland	Associated	Reedy	Novak	TRC	Reedy	Associated	Lumina	Associated/Reedy
9	8	Joel Johnson	Comp. Craft	Trinity	Novak	TRC	Trinity Pushed	Bolink	Thunderbird	Trinity/Comp. Craft
10	7	Bud Bartos	Associated	CAM	Novak	TRC	Power Push	Associated	Lumina	Bud's Racing/Power Push

its suspension system was a replica of that found on the full-scale stock car. Jeff Caudle captured 2nd place with Rick Wilson's Kodak Oldsmobile; and the Phil Parson's Crown Oil/Skoal Classic Oldsmobile earned Drew Waters 3rd place.

Karl Stockman won the McAllister Best Paint category with a beautiful Primo Beer stock car; Ken Canniff's Cherry Coke Lumina stock car finished 2nd, and Rich Casteline took 3rd with his Ritz Big Print One-Hour Photo TransAm.

This Was It!!

When the track was clear, the Car Action Race of Champions Mains got under way. A major race needs a high-quality scoring system so that nobody can dispute the lap counting, and at Whippoorwill, this requirement was met by the Track Mate Scoring system. The system provided detailed computer print-outs of all performances in the Qualifiers and the Mains. By interfacing the Track Mate with the AMB scoring system to

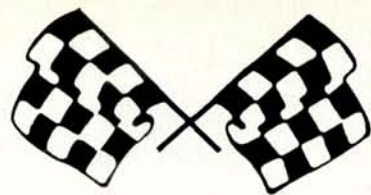


As you can see on the scoreboard, the lead car was in the pits at the 70-lap mark.



The most famous line-up of cars in R/C racing is found at Lake Whippoorwill.





When the rain stopped late on Friday afternoon, the super-speedway Mains got under way.



Dan Toll wore a custom-made hat that was a duplicate of his Concours-winning machine.

double-check all results, the number of scoring challenges was kept to a minimum. In view of the unusually high temperatures, it was just as well that this source of arguments had been dealt with. Heat means hot tempers, and we didn't want any casualties!

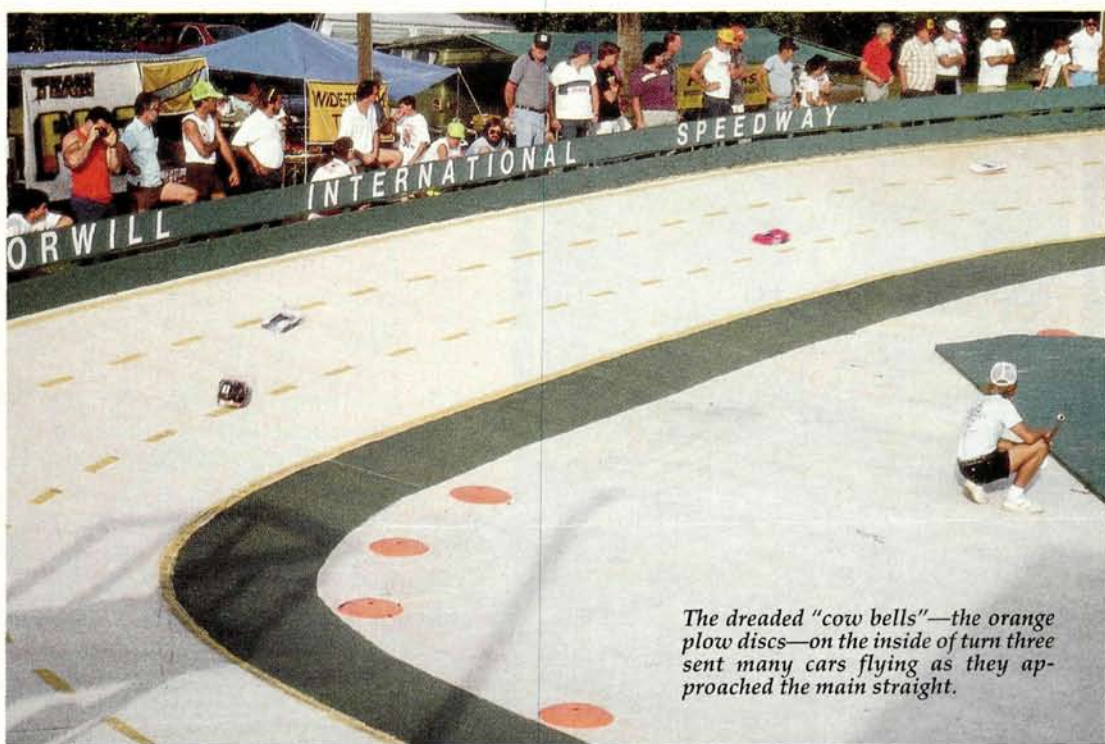
As usual, the three A-Mains were last on the schedule. After the lower Mains had been run, the Amateur Stock A-Main drivers took to the track. On the opening lap, Ricky Jordan grabbed the lead and never let up, even though a tangle with another racer in the 22nd lap caused his car to spin 360 degrees. Jordan kept up his pace and successfully continued his run to the checkered flag! His LTO completed 36 laps a little over 1.5 seconds ahead of Mike Kohler, who drove a Composite Craft car from sixth on the starting grid. Finishing 3rd with an Asso-

ciated 10L, Edmond Lacoste also completed 36 laps, and he was less than 2 seconds behind Jordan.

Next came the Amateur Modified A-Main. Tony Carrigg drove his Redline-powered Associated 10L to victory

With 280 amateur drivers and more than 70 pros, the weekend promised to be busy.

from fourth on the starting grid. Carrigg completed 38 laps in 4:03.39, and John Nemcovic was .81 second behind him at the checkered flag. (He drove his Phantom-powered TRC



The dreaded "cow bells"—the orange plow discs—on the inside of turn three sent many cars flying as they approached the main straight.



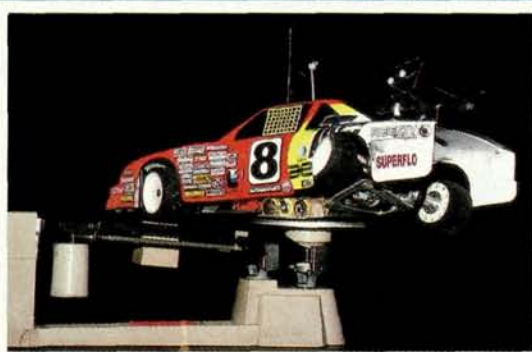
The Whippoorwill track offers lots of room for passing, high or low.

AMATEUR MODIFIED

Fin	Qual	Name	Chassis	Motor	Speed Cont.	Tires	Body Mfg.	Body Style
1	4	Tony Carrigg	Associated	Redline	Novak	TRC	Bolink	LeBaron
2	6	John Nemcovic	TRC	Fantom	Tekin	TRC	Andy's	Thunderbird
3	5	Robbie Dodd	Associated	CAM	Novak	TRC	McAllister	Thunderbird
4	9	Mike Boylan	Associated	Twister	Novak	CKW	Andy's	Thunderbird
5	1	Jan Limpach	Associated	Reedy	Novak	TRC	Associated	Lumina
6	7	Jeff Irish	Bolink	Litespeed	Novak	TRC	Bolink	Pontiac
7	10	Bruce Bunch	Comp. Craft	B&R	Dialed	TRC	MRP	Lumina
8	3	Jill Simms	Comp. Craft	CAM	Novak	TRC	Bolink	Thunderbird
9	8	Tom Ahles	Comp. Craft	Trinity	Novak	TRC	Bolink	Lumina
10	2	Mark Johnson	TRC	Trinity	Novak	TRC	Bolink	Lumina

AMATEUR STOCK

Fin	Qual	Name	Chassis	Motor	Speed Cont.	Tires	Body Mfg.	Body Style
1	2	Ricky Jordan	Bolink	S	Novak	Bolink	Bolink	IROC
2	6	Mike Kohler	Comp. Craft	P	PDI	TRC	Bolink	IROC
3	4	Edmond LaCoste	Associated	E	Novak	Motion Comp.	MRP	Capri
4	1	John Walters	Comp. Craft	E	Tekin	Twinn-K	Bolink	IROC
5	8	Nathan Wincek	Comp. Craft	D	Novak	Minitech/TRC	Bolink	IROC
6	3	Diane Rivers	PRC	W	PDI	Dearth	Bolink	IROC
7	9	Don Smolik	Bolink	O	Novak	Bolink	Bolink	IROC
8	7	John DiDonna	PRC	R	Novak	Dearth	MRP	Capri
9	5	Randy Wheeler	PRC	K	Novak	Dearth	MRP	Capri
10	10	Bill Edwards	PRC	S	Novak	Dearth	MRP	Capri



Kent Clausen's 10L/Probe superspeedway car suffered major damage during the Novak 200.

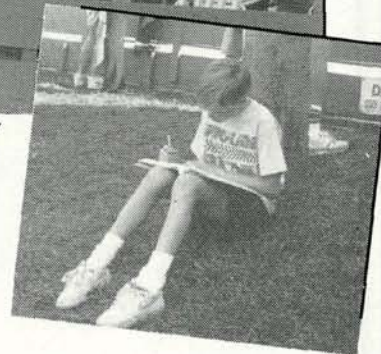


Steve Stifel of Probe Enterprises, won the Invitational Class Sportsmanship Award from Dan's RC Stuff. Kim Rule and Dan Moynihan presented the trophy to Steve.



Above: Bob Hosch "worked" the crowd with the portable mike during a break in the action.

Right: Billy Bradford was allowed to attend the Car Action Weekend, but he still had to do his homework!



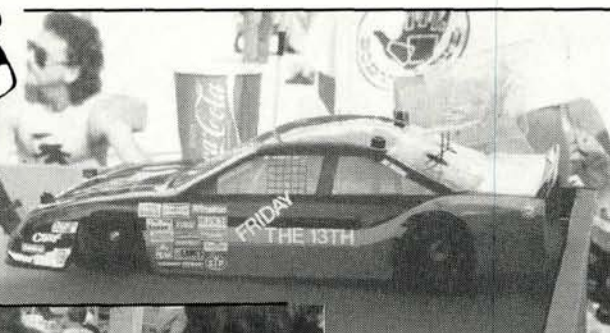
Pro 10 from the sixth starting spot.) Driving his CAM-powered 10L, Robbie Dodd finished 3rd, one lap off the pace.

In the Pro Modified A-Main, Paul Davis got the jump on the field at the drop of the green flag. Part way through the race, Clausen and Bartos collided going through the third turn, and after that, Clausen seemed to have the fastest car on the track, and he started to work his way through the traffic.

Clausen soon had company, as Doseck showed up on his rear bumper, passed quickly, and set his sights on Davis. But time ran out before Doseck could take the lead, and at the checkered flag, it was Davis (driving a Redline/Composite Craft Lynx II) with



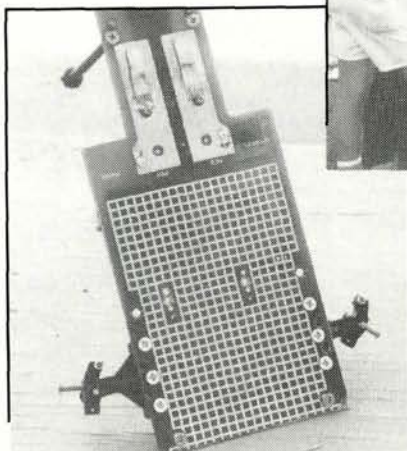
The superspeedway Mains took place on Friday the 13th. This car would have been appropriate for several drivers.



New tire technology brought out many new manufacturers. Here, one of the SAT crew works on tires in the pits.



On Saturday afternoon, the TRC/Composite Craft crew held an open house/autograph session under the tents.



Above: This grid is the integrated radio antenna on the Probe 10L Superspeedway chassis.



Right: Ricky Jordan being interviewed by Bob Hosch and Gary Owens immediately after winning the Stock A-Main.

41 laps in 4:01.94; Doseck—1.65 seconds behind Davis with his Composite Craft/CAM Lynx II; and Clausen, whose Associated/Reedy 10L finished 3rd, just .6 second behind Doseck. Only the top three drivers completed 41 laps. The other seven finished with 40 laps, and just over 6 seconds separated the 4th- and 10th-place drivers.

The Third Annual Car Action Weekend is in the record books. Once again, Bob Hosch put on a tremendous show at his Lake Whippoorwill International Speedway, and Car Action sponsored the year's major oval race. Don't miss out next year when the Fourth Annual Car Action Weekend hits the track. ■

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PHOTOS BY STEVE POND

by WALLY DAVID

THERE'S A certain thrill in leaning a high-powered racing motorcycle into a turn, nearly scraping your knee on the ground, then easing the cycle back up to rip down the straightaway. Racing slicks give your Honda VFR750R Superbike maximum road-gripping stability and control, but if you get into trouble and have to lay the bike down, fear not: I'm talking about a 1/5-scale R/C motorcycle!

Manufactured by the Green Corp. for Royal Products*, the Honda RC30 is a replica of the Honda VFR750R racing cycle that has competed successfully around the world. The RC30 comes completely assembled. As soon as you charge a 6-cell 1200 to 1700mAh battery pack and add six AA batteries for the 27-band radio that comes with the bike, it's ready to roll.

ROYAL PRODUCTS

HONDA RC30

Type Racing motorcycle
 Scale 1/5
 Sug. Retail Price \$139.95

DIMENSIONS:

Overall Length 16.5 inches
 Width 5.5 inches
 Height 12 inches
 Wheelbase 11.5 inches

WEIGHT: 4 pounds, 3 ounces

BODY:

Type Honda VFR750R w/driver
 Material Injection-molded plastic

CHASSIS:

Type Sealed box
 Material Injection-molded plastic

DRIVE TRAIN:

Primary Belt and pulleys
 Transmission Gear drive
 Bushings Plastic bushings

SUSPENSION:

Front: Type Twin fork
 Dampening Coil springs
 Rear: Type Swing arm
 Dampening Coil-over shock

WHEELS:

Front: Type Plastic
 Dimensions (DxW) 3.25x.75
 inches
 Rear: Type Plastic
 Dimensions (DxW) 3.5x1
 inches

TIRES:

Front and Rear Rubber

ELECTRICS:

Motor Mabuchi 380
 Battery 6-cell flat pack*
 Speed Control Electronic

OPTIONS AS TESTED:

Tamiya EX 6-cell; 1700mAh Racing Pack.

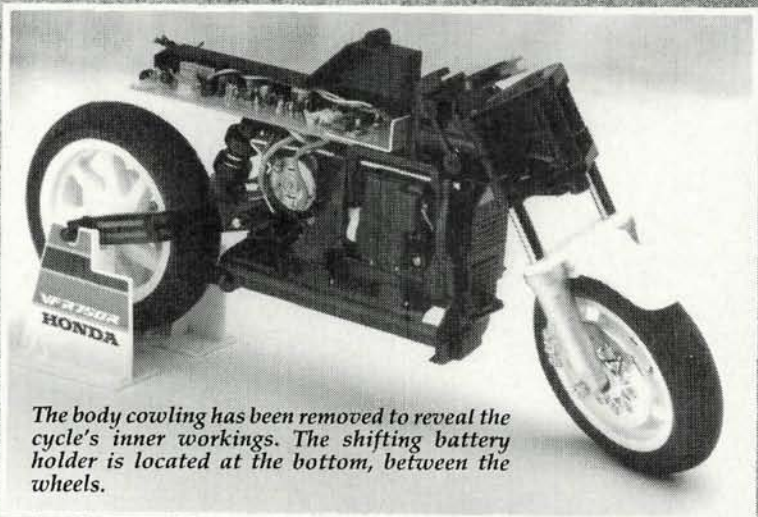
COMMENTS:

The Royal Products Honda RC30 is a wonderfully detailed scale model that comes completely ready to roll. Owing to its shifting ballast system, it was very stable, even at slow speeds. Speed was disappointing, as was the tendency of the front end to wobble over bumps, although this didn't affect handling. Overall, a blast to drive.

*NOT INCLUDED

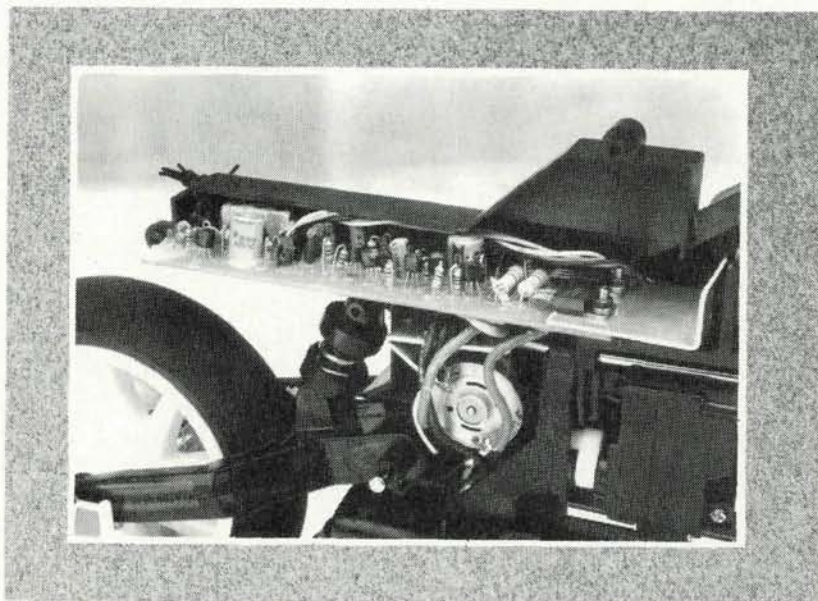


The Royal Products Honda RC30 comes assembled and includes a 2-stick radio. Just charge the Tamiya EX 6-cell 1700mAh battery pack and go!



The body cowling has been removed to reveal the cycle's inner workings. The shifting battery holder is located at the bottom, between the wheels.

THE KIT: The Honda RC30 comes with several interesting features: a 2-channel stick radio with steering and throttle trim; an electronic speed control with proportional forward and full braking; a Mabuchi 380 motor; a maintenance-free belt-drive system; anti-roll training wheels that are easy to in-



The receiver/speed-control combo occupies the upper part of the cycle; underneath is the 380.

Right: Three gears and a belt transfer power to the rear wheel. A different gear ratio is available for more speed.

stall and remove; fully working front and rear suspension; rubber racing slicks; beautifully painted bodywork; a realistic-looking rider; and a display/launch stand.

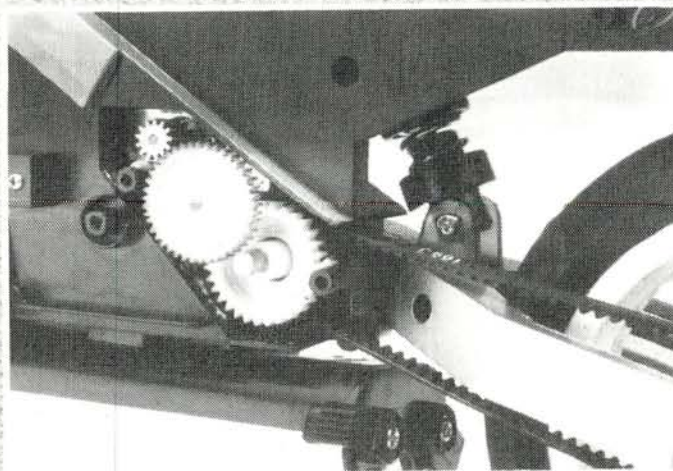
The truly unique thing about the RC30 is the shifting-ballast steering system that moves the battery holder at the bottom of the cycle from side to side in response to the servo. If you throw the stick to the right, the servo shifts the right side of the cycle, causing it to lean into the turn.

DISASSEMBLY: When I review an R/C vehicle, I usually find out how it works during the construction. With the RC30, however, things went in reverse. Because the cycle came assembled, I decided to take this "bad boy" apart to see what makes it move. After removing every screw I could see, the body cowling and the driver came off, and I was left with the plastic case that holds the innards in place. After removing another dozen screws, I was in like Flynn!

The first thing I saw was the receiver/electronic speed controller combination, which runs the length of the upper part of the cycle. This combo is wired to the Mabuchi 380 motor, which is mated to a pinion gear/counter gear/pulley setup that moves the drive belt, which turns the rear wheel. The rear wheel is supported by a stiff, coil-over shock.

Moving forward, I came across a vertically mounted servo, with a motor nearly as large as the 380 drive motor! The servo is connected to a battery holder that's located at the bottom of the cycle between the front and rear tires. The servo swings the battery holder from side to side, which causes the cycle to lean, and this makes the cycle turn left or right.

The front fork is connected to the rest of the cycle by a single pivot rod, and it's turned by the motion of the cycle



as it leans in reaction to the shifting battery. The front wheel won't turn when the cycle is stationary. Springs in cylinders on each side of the front wheel provide suspension.

After I had completely dissected the cycle, I put it back together and only came up with six extra screws. (*Just kidding!*)

PERFORMANCE: With a fully charged 1700mAh, 6-cell battery pack, Steve "Ice-Covered" Pond and I headed to a nearby parking lot to see what the RC30 could do.

The first thing that struck me was how realistic the cycle looked as it went by. I could see every detail of the sharply painted body—because it wasn't moving very fast! Although speed was sacrificed for a long run time (it ran for more than 30 minutes), the cycle was still a blast to drive.

I was truly amazed at how straight the RC30 tracked! I was also surprised at how different driving a motorcycle is from driving a car. Steering a cycle requires much more finesse: you can't just crank the front wheel and expect it

to make a 180-degree turn! The stick on the transmitter must be thrown slightly in advance, so the cycle can lean into the turn. Don't worry about leaning the cycle over too far: the training wheels prevent it from falling over. I found that if I jammed on the brakes and threw the steering stick in the direction of the turn, the cycle could make some pretty sharp turns!

The only handling problem was with the front end. The front fork is left free to follow the weight shift, but it can be unstable over bumps, and this is compounded by the light springs on the front fork. The front wheel wobbled and shuddered, but it never caused the cycle to crash—it just looked a little scary! I applied some silicone lube from Bud's Racing Products* to the front forks, and this slowed the front suspension action slightly.

Overall, the Royal Honda RC30 was a lot of fun

(Continued on page 112)



A servo motor nearly as big as the 380 drive motor is needed to move the battery holder.

MOTOR ANALYZING DYNO

KEEP 'EM HUMMIN'

by WALLY DAVID

DID YOU EVER wonder why Bud Bartos is usually one of the fastest at any big race, no matter what the scale? Well, now we know one of the reasons: it's the Bud's Racing Products* Motor Analyzing Dyno.

Design Simplicity

This dyno is a simple, gray, metal box with an on/off rocker switch to control the power, a toggle switch to take amp and volt readings, and a three-position switch to apply various loads.

The Motor Analyzing Dyno comes with a stand, with a d j u s t a b l e brackets to hold the test motor and the load motor in place during testing. A piece of rubber fuel tubing connects the shafts.

One set of wires ends in alligator clips that

Clearly marked "on/off," "amp/rpm" and load switches make the dyno easy to use!

attach to the test motor. These wires send power to the motor, and they provide the amp-draw numbers when the toggle switch is flipped to "amp" on the dyno.

The instruction sheet recommends that you always use the same motor for creating load, so the second set of wires should be soldered on, not clipped. A third set of wires goes to the power source. Your digital voltmeter can be plugged into the jacks on top of the dyno to read the amps and volts.

Bud highly recommends the use of a 4-cell battery pack that will give you 4.8 volts. If you do a lot of dyno work, you can wire a pair of 4-cell packs in parallel; this gives the same voltage, but longer testing time.

A 6-cell pack can be used, but it puts a strain on the shaft coupling at start-up. I prefer to use a battery charger with adjustable current. The source is much more stable, and the dyno won't lose power, as it would when a bat-



The Bud's Racing Products Motor Analyzing Dyno comes with a dual motor holder; the test motor is on the left, while the load motor is on the right. (Motors aren't included.) The dyno has jacks for your digital voltmeter.

tery pack dumps. Just make a mark on the face of the charger so that you can always return to the same power setting and get consistent readings.

Dyno Dynamics

1. With the test motor installed and the power source connected, set the load switch to 1, which is free-wheeling.
2. Turn the power switch on, making sure the motor is rotating correctly.
3. Flip the motor switch to "amp," and you should see a reading of around .500 on your dvm. Move the decimal point one place to the right to get the amp level drawn by the motor (5.00).
4. Without changing the load, change the motor switch to rpm (volts). The reading will give you a reference number (approximately 6.00) against which to judge your rpm. (The load motor is used as a generator to produce the rpm reading.) Record all your data on the handy log sheet included with the dyno.
5. Repeat these steps for load 2 and load 3 settings, and record those figures.

Things To Remember

After spending some time experimenting at the track, you'll begin to see the most effective way to set up a motor. You'll be able to relate your numbers to how the car performs on the track and adjust the gearing accordingly.

Each unit is different, so comparing yours with that of a friend won't give you valuable information. The power supply, load motor condition and dvm all have an impact on your readings. Be consistent in taking your readings quickly, because they can fluctuate.

I've found that a motor that isn't affected much when placed under load will prove to be the most efficient.

By playing with different springs and brushes, you can tune the car to a particular track.

With stock motors, I try to get the motor to draw as few amps as possible, while turning the most rpm. I get the best results when the average amp draw is around 4 amps, and the rpm number is around 575 to 600, on the no. 1 setting. If the motor draws fewer amps, you run the risk of "brush bouncing," which causes arcing and brush failure.

Modifieds are a little different, as the test data depends on how many turns the motor has. Until you're experienced, the best use for the dyno with mod motors is to detect any deterioration by comparing your motor's performances over time.

Dyno to Die for?!

The Bud's Racing Products Motor Analyzing Dyno is a very useful tool for maximizing and keeping track of your motors' performance. The switches are clearly labeled and feel firm, and this tells you that the Dyno's a high-quality product. By using your dvm for both volts and amps, you get accurate digital readings. The unit is compact and leaves plenty of space on your pit table, although the wires can become tangled.

The instructions leave a little to be desired; it doesn't seem as though much time was spent on them. I would have appreciated tips on where to start when working on a motor. It's left up to you to figure things out.

Overall, this dyno is a valuable tool that I wouldn't do without. I can't imagine being unable to evaluate my motors before a big race. I guess we now know why Bud is so fast?!

**Here's the address of the company featured in this article:
Bud's Racing Products, 52435 Rte. 113,
Wakeman, OH 44889.*

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DRAG RACING

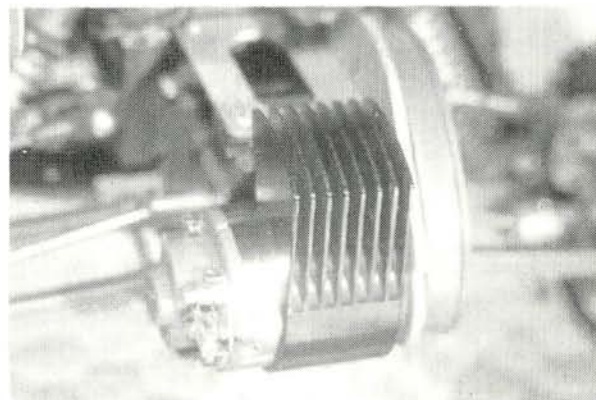
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by JIM DAHL

astute

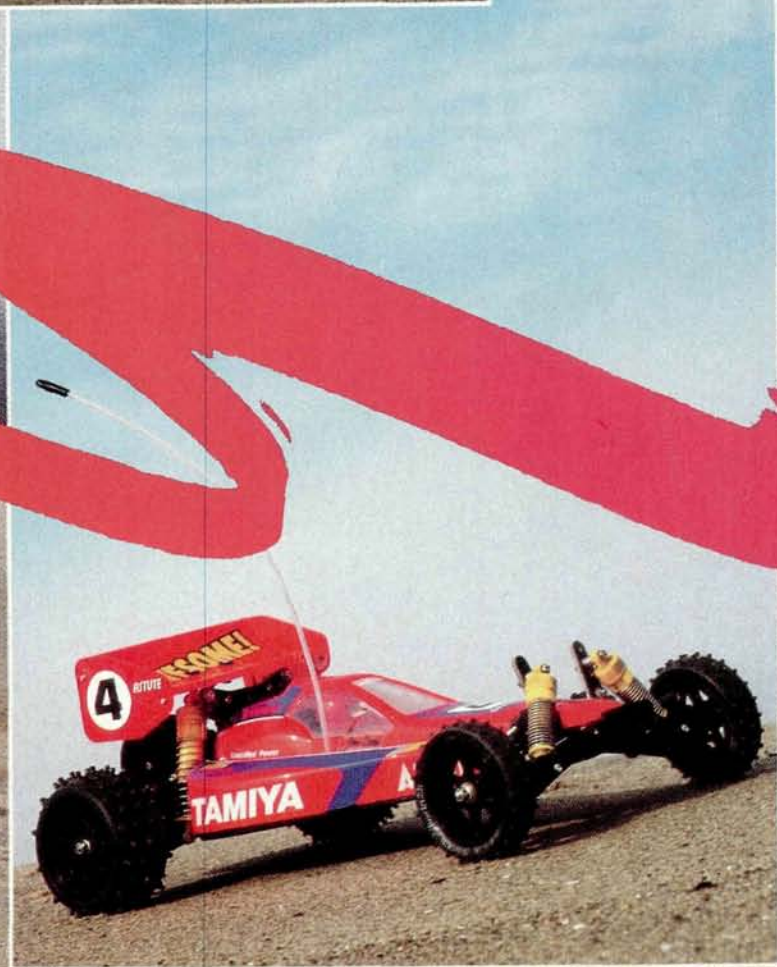


GETTING SERIOUS

RIGHT FROM the earliest days of gas engines and tube radios, I wanted an R/C car, and at a hobby show five years ago, I finally yielded

to temptation and bought a Tamiya* Fox and all its necessities. After spending most of one weekend assembling and testing it, I knew I was hooked, and when Tamiya introduced its new 2WD Astute, I just had to have one.

THE KIT: The Astute brings back fond



memories of those early days. Typical of Tamiya, the packaging is colorful and informative, and the parts are well-organized. The special parts are on a platform, and each is labeled under its own blister. Next to this is a beautiful body, chassis decals and related parts. In the remaining section, all the plastic and metal parts are bagged in groups, which makes assembly extremely easy.

ASSEMBLY: The 32-page instruction

manual is a work of art, with beautiful drawings that provide all the necessary information, including the correct viewing angles, with certain parts highlighted and other areas lightened. Next to each illustration is a parts list, complete with scale drawings, descriptions, numbers, quantities and its location. Some tools are provided.

These little cars will vibrate a lot—

Type 2WD off-road
 Scale 1/10
 Sug. Retail Price \$220

DIMENSIONS:

Overall Length 15 inches
 Width 9.75 inches
 Height 5.5 inches
 Wheelbase 10.5 inches
 Front Track 8 inches
 Rear Track 8.25 inches

WEIGHT:

Gross (w/bat.) 56.86 ounces

BODY:

Type Off-road buggy
 Material Polycarbonate

CHASSIS:

Type Single plane
 Material Fiberglass

DRIVE TRAIN:

Primary Pinion/spur
 Transmission Gear drive
 Differential(s) Ball differential
 Bearings/Bushings .. Six ball bearings,
 plus Oilite bushings

SUSPENSION:

Front & Rear:
 Type Lower A-arms/upper control link
 Dampening Plastic oil-filled, coil-over
 shocks

WHEELS

Front: Type Plastic, one-piece
 Dimensions (DxW) 2.06x.75
 inches
 Rear: Type Plastic, one-piece
 Dimensions (DxW) 2.125x1.4
 inches

TIRES:

Front & Rear Low-profile, pin-spoke

ELECTRICS:

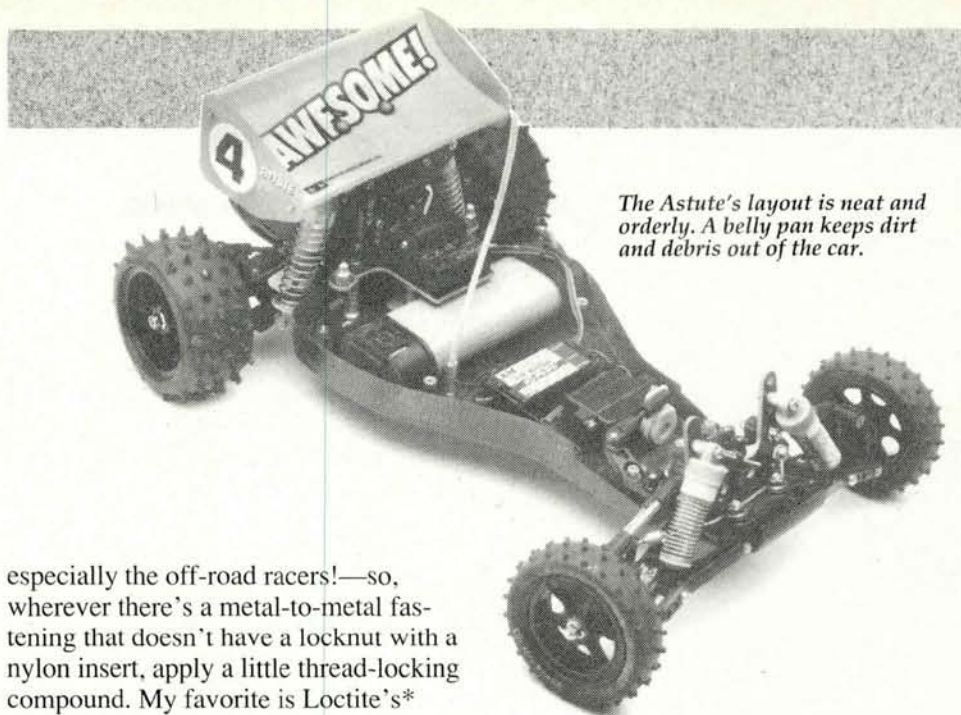
Motor RS 540S
 Battery 6-cell stick pack (not included)
 Speed Controller .3-step forward/reverse

OPTIONS AS TESTED:

KO Propo Ex 1 radio with PS 901BH servo and CX-4 electronic Temfet Speed Controller; Tamiya 1200 SC 7.2V battery pack.

COMMENTS:

Competition-oriented 2WD racer. Smooth ball differential, but time-consuming to adjust. Needs electronic speed controller, large metal shocks and some ball bearings to reach full potential. Looks good and is fun!



The Astute's layout is neat and orderly. A belly pan keeps dirt and debris out of the car.

especially the off-road racers!—so, wherever there's a metal-to-metal fastening that doesn't have a locknut with a nylon insert, apply a little thread-locking compound. My favorite is Loctite's* blue 242 Threadlocker: it holds things together, but you can still get them apart when necessary.

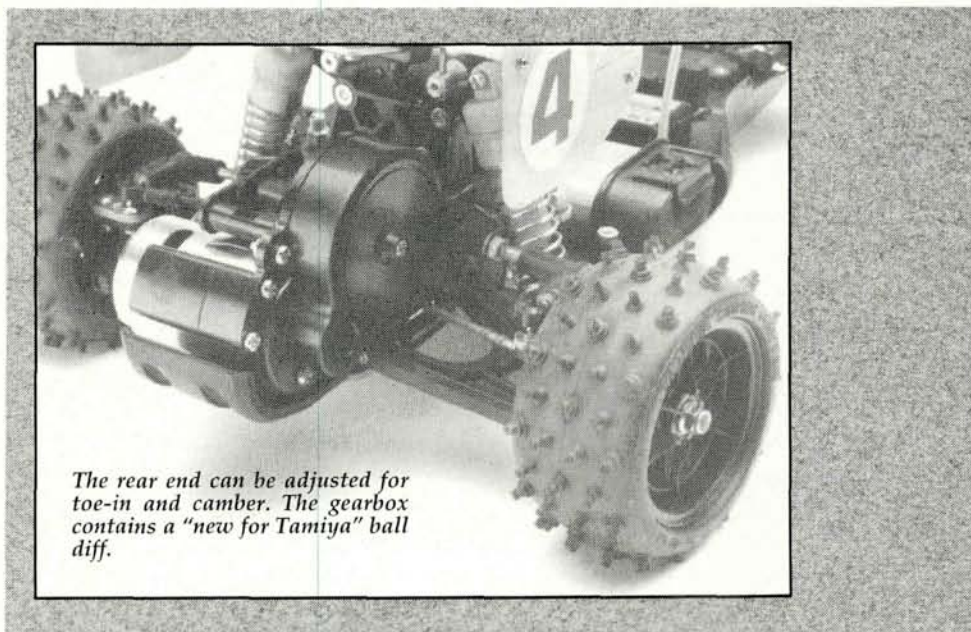
Two notable features appear in Step 1 (no, I won't review every step!). First, there are press nuts that press into the plastic and eliminate the need for a wrench. It would be better if they locked after being drawn into the hole; as it is, the nuts usually fall out when you remove a screw. Second, bronze Oilite bushings (36 in all) are used wherever a steel shaft pivots. Later on, you might want to replace all these with ball bearings. If you're curious, the total weight of these parts is .95 ounce.

The first eight steps cover front-end assembly, which goes together easily. As you can see in the photographs, the result is similar to other cars in this category. The sway (or anti-roll) bar seems a little short, and some left/right-threaded

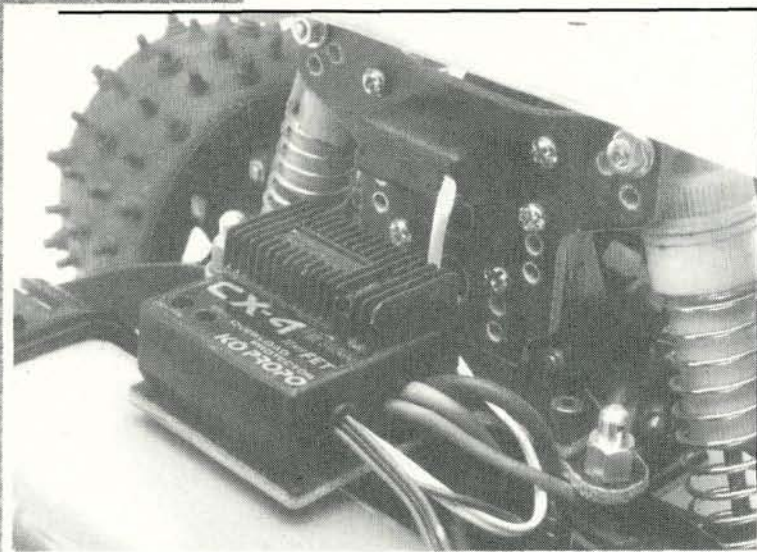
turnbuckles would have been handy for easy adjustment at the track.

Bump-steer is eliminated with nearly perfect steering-linkage geometry, and the upper threaded links are large (4mm) and sturdy. A second box wrench would have been very helpful in several steps, as nuts are often used on two ends.

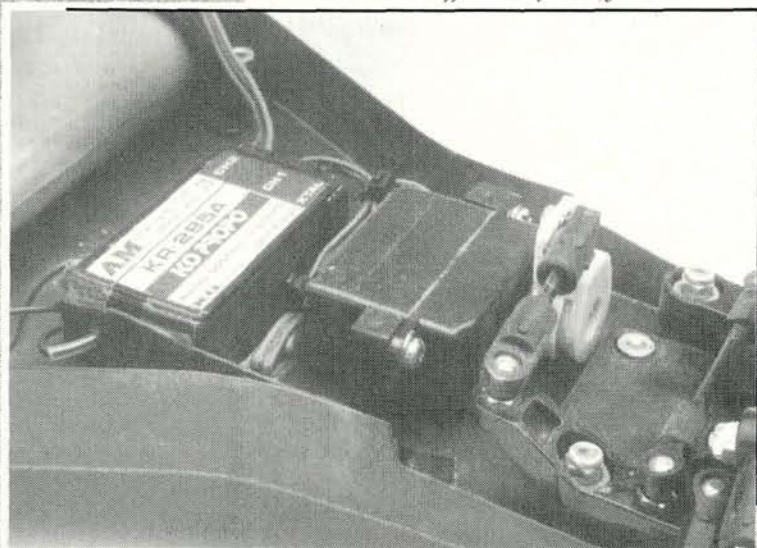
Step 12 introduces an item new to Tamiya fans: a ball differential. This differential is very well engineered, and it has beautiful cast-alloy hubs, splined steel universals, one thrust bearing on each side, differential rings with hex-hole centers (like the Losi JR-X2), and a reinforced-plastic diff spur gear. There's one catch, however: to adjust this differential, you must remove a plate from underneath the transmission through the chassis plate. Then you have to remove



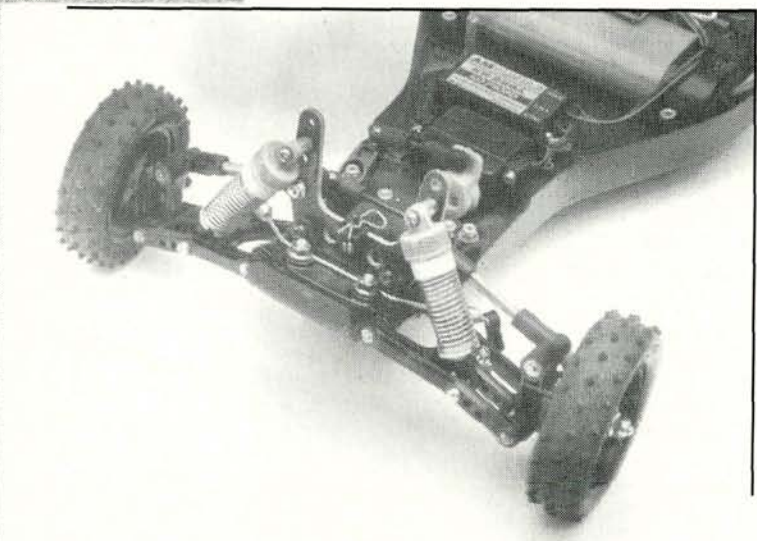
The rear end can be adjusted for toe-in and camber. The gearbox contains a "new for Tamiya" ball diff.



KO Propo CX-4 ESC mounted to a custom-made fiberglass shelf. A hole was cut in the shock tower to mount the on/off switch for easy access.



Beefy ball links and a KO Propo radio system provide plenty of control.



Although the front end uses current off-road technology, the suspension travel is severely limited. Longer shocks would help.

the axles, universals and diff; disassemble the diff; remove or replace some very thin steel spacers; and reassemble everything! This is a lot of work for one of the most frequently adjusted parts of an R/C car.

The rest of the transmission assembly is straightforward and includes an aluminum motor plate, an external spur gear with two sealed ball bearings, four other sealed ball bearings and a plastic gear cover. The gear mesh is easy to adjust, but it takes four screws to remove the gear cover.

Steps 13 through 21 cover the final assembly of the rear suspension, and here again are those sturdy 4mm rods. There are quite a few parts, but if you follow the steps and illustrations carefully, everything will go together properly.

Of particular interest in the rear suspension are the forged axles and the two-piece rear hubs, which allow you to adjust the rear toe-in. Most R/C cars have up to three degrees toe-in on each side at the rear wheels, which can't be adjusted. This makes it easy to drive the car in a straight line, but it can also create "push" (i.e., the car wants to continue in a straight line when the driver tries to make a turn). Less toe-in makes it easier to turn the car, but more difficult to drive it in a straight line. The Astute is one of the first cars to come with adjustable rear toe-in. The mechanical speed control is next. If you use a 540 or 540S motor and a 6-cell battery, this speed controller should be strong and serviceable, but if you run a more powerful stock-class motor, it won't last long under the heavier load. An electronic speed control is probably the best investment you can make. The current Tempfet versions are practically indestructible (if you don't wire them backwards!), and they don't even require a fuse.

The Astute's stock shock absorbers are the familiar, yellow, plastic units that have remained basically the same for years. Here again, these are fine if you're driving for fun, but they should be upgraded if you plan to do some serious racing. To complete the suspension, beautiful, black, unidirectional wheels with sharp-looking spike tires go on the corners. Tamiya suggests that you glue

the tires to the wheels, but I don't recommend it. The tires fit very tightly, and they're so hard to get on that I doubt they'll ever spin, much less come off! Another reason to glue tires to rims is that it seals the air in and the dirt out. Of course, this means that you must glue all the way around the rim, inside and out, and this causes a bouncy ride. To soften this effect, many racers drill small holes (approximately 1/8 inch) in the wheels.

The rear wheels fit over large hex nuts, which, in turn, fit over splines on the rear axles. This is the best design for a 1/10-scale dirt car that I've seen yet! Ball bearings for the front wheels should be one of your first upgrades.

My radio gear was being used in other cars, so I had to put a new radio in the Astute. I chose the KO Propo* EX1, with a PS 901BH high-speed, ball-bearing servo and a CX4 Tempfet speed controller. This system has all the features and adjustability you could want for racing, and it's the choice of many top professional R/C drivers.

Radio installation was quite simple: I bolted the servo into place according to Tamiya's instructions, and I taped the receiver servo onto the chassis just behind it. I made a 2x3-inch fiberglass shelf on which to mount the speed controller, and I bolted it where the original speed controller assembly would have gone. High in the center of the rear shock tower, I bolted the on/off switch, so it's accessible, but safe.

The Astute's exciting new body and wing are perfectly formed in clear polycarbonate. A complete undertray protects the chassis and helps to keep dirt out of the car. For easier access to the diff cover, I cut off the tail end of this bottom cover. Although Tamiya suggests using Velcro, I lined the space between the upper and lower body halves with soft, foam weather stripping. This makes it much easier to remove the body and still keep out the dirt.

I wanted to use the colorful decals that came with the kit, so I painted the upper body and wing with Pactra's* Fluorescent Orange. If you use bright or light colors, back them up with a coat of white (unless you're trying to achieve a special effect). Tamiya provided labels for the windows, but I masked them off because I'd promised my old Fox driver

a seat in this ride. I masked the windows with thin, plastic packing tape that I trimmed with an X-Acto knife for nearly perfect edges.

PERFORMANCE: The weight limit for the 2WD off-road racing class is 3 pounds, 4 ounces. At 3 pounds, 8.86 ounces, the Astute is almost 5 ounces over the limit, and this doesn't even include my driver, which weighs .75 ounce. There are very few areas where weight can be removed, so you might have to live with the extra weight.

In general, this car handled very well. The suspension travel wasn't as great as those of the current winning off-roaders, perhaps because Japan has smoother tracks. The differential provided smooth, straight acceleration, and required no further adjustment. By using a much lighter 5WT shock oil and pistons that have the most openings, the front shock absorbers worked quite well. I kept the rod adjustments that the instructions suggested, and all the caster, camber and toe-in angles were just fine.

On the track, the Astute was fast and easy to drive, but it had a tendency to understeer. Changes to the suspension and the rear toe-in had no major effect, but tires with less rear traction may alleviate this problem.

The Astute's extra weight caused it to bottom-out on some of the jumps, but heavier springs or shock oil (or both) would hurt performance on the rest of the racecourse.

The Astute went together quite easily, and the illustrations provided most of the information. The written directions are minimal, which could slow down beginners, but with patience and care, you'll have few problems and a fine finished product. If you're a club racer and want a great-looking car that's full of marvelous engineering features, the Astute could be just right. I'm going to put the Astute through its paces, and I'll have the results for you in an upcoming issue. I'll try different shocks and ball bearings, and then I'll compare it to the competition. Until then, have fun racing!

**Here are the addresses of the companies mentioned in this article:*

Tamiya/MRC, P.O. Box 267, Edison, NJ 08818.
Loctite Corp., 18731 Cranwood Park, Cleveland, OH 44128

KO Propo/Global Hobby, 10725 Ellis Ave., Fountain Valley, CA 92728.

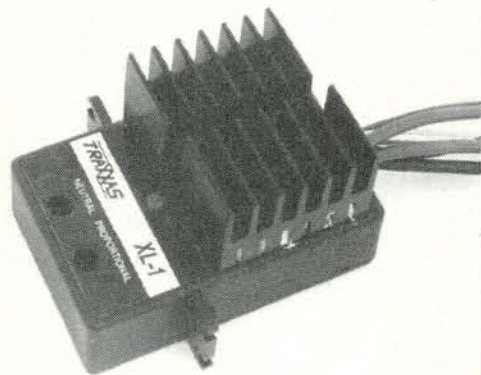
Pactra, 1000 Lake Rd., Medina, OH 44256. ■

Of particular interest in the rear suspension are the forged axles and the two-piece rear hubs, which allow you to adjust the rear toe-in.

SCOPING OUT

by JOHN RIST

Traxxas XL-1 Reversing Speed Controller



The Traxxas XL-1's low retail price makes it a good choice for racers who want a reversing speed control to replace their mechanical ones.

WHAT COMES IN a brightly colored box and can improve the performance of your favorite backyard dirt-burning R/C car or monster truck? The answer: the Traxxas* XL-1 electronic speed controller, which is the subject of this month's "Scoping Out."

The first thing to burn out in an R/C car is the mechanical speed controller, because large amounts of current flow through the system when we "hammering" drivers put the pedal to the metal. With today's battery and motor combinations, 25 amps isn't uncommon.

Another factor that contributes to the arcing and sparking of a mechanical speed controller is dirt, which gets inside and grinds off the silver or gold plating from

the contacts. Once arcing starts, it's only a matter of time before the "go" is all gone!

The Traxxas XL-1 cures all these problems because it has no contacts to burn out. All the current is handled by the 12-Mosfet transistor, which provides the switching action without having any moving parts. The Traxxas XL-1 has these features:

- Fully proportional forward and reverse
- Large built-in heat sinks
- Built-in LED for forward, neutral and reverse

- Full set of connectors—Tamiya-style for the battery, bullet-style for the motor

Whenever I add a new weapon to my arsenal of trick parts, I check out what's in the box. Traxxas packaged its speed controller well, protecting it with a custom-fitting Styrofoam insert. I removed the Traxxas XL-1 from its case and found that it was well-constructed. Its big size allows plenty of room for all the parts, and the filter caps have a large capacity, which should help eliminate glitching. The Traxxas XL-1 comes with a full set of connectors and, for the most part, all you do to install it is remove the old mechanical speed controller and its servo, then install and plug in the new one.

The first step in evaluating a speed controller is to check its performance using my test-lab setup. I control it with

THE "SCOPING OUT" LAB

John Rist's lab consists of:

- an oscilloscope
- a digital voltmeter
- a resistor load bank
- a 6V 30-amp electricity supply.

The oscilloscope is used to monitor the controller's output and to guarantee that it's fully on.

The digital voltmeter takes all the voltage-drop readings and verifies the reading on the current meter.

The resistor load bank is a bank of 40, 12-ohm 5-watt power resistors, which can be switched on and off one at a time to vary the load between .6 amps and 20 amps.

In series with the resistors is a 25-amp Simpson current meter and a 1-percent .01-ohm resistor. By measuring the voltage drop across this resistor, the current-meter's reading can be double-checked. Of course, the lab power supply supplies the test current.

TRAXXAS

XL-1

Type XL-1
Sug. Retail Price \$60

DIMENSIONS:

Height with Heat Sink 1.5 inches
Width 1.5 inches
Length 2.38 inches
Weight 3.6 ounces
Access to Controls Excellent
Ease of Adjustment Fair
Warranty 30 days

ELECTRICAL:

(Manufacturer's Specs)

Max. Voltage 9.6 volts
Min. Voltage 4.8 volts
Max. Current Forward ... 150 amps
Continuous Current Forward 75
amps
Resistance021 ohms

TEST PARAMETERS:

Voltage 6 volts
Current 12 amps
Voltage Drop48 volt
Resistance 0.04 ohms
BEC Output, 6-Cell Battery 5.71
volts
BEC Output, 7-Cell Battery 5.73
volts

COMMENTS:

The XL-1 is a large speed controller that should work nicely in a monster truck. It has a smooth throttle response and delivers lots of power to the wheels. The instruction sheet didn't have any diagrams to show first-time users how to install it, and the built-in LED didn't accurately indicate the full-throttle point. I was able to set the throttle by listening for maximum motor speed. At the suggested price of \$60, the Traxxas XL-1 is a good buy for anyone who wants to replace a mechanical speed controller with a reversing speed controller.

a servo tester that I developed and call the Pit Stop Radio. (See my article on how to build a Pit Stop Radio elsewhere in this issue.) Because it has reverse, the Traxxas XL-1 isn't intended for all-out racing. It's designed to add reliability and zip to your neighborhood cruiser. In keeping with this, I tested the Traxxas XL-1 with the full set of connectors in place.

When I passed 12 amps of current, there was a .48V drop, which I calculate gives a resistance of .04 ohms. This is about double the specified resistance (.021 ohms), but as I've pointed out before, most manufacturers state only the loss of FETs in the controller; they don't include the resistance of the wiring and the connectors. I suspect that much of the .04-ohm resistance could be eliminated by replacing the connectors with high-grade ones like Litespeed's* silver-plated Super-Connectors.

There's a catch, however: the Traxxas XL-1 uses red and black leads for both the battery and the motor. If you cut off the motor and battery connectors at the same time, there's no way to tell which is which. My advice is to replace them one at a time to avoid a mix-up.

One more word of caution: the two red leads are *not* tied together inside the speed controller (as they are in most forward-only, with-brake speed controllers). This is to permit reverse polarity on the motor leads when running backwards. As a result, it's impossible to direct-wire one side of the motor to the battery, as you can with a racing-style forward-only speed controller.

Next was the "let it cook test." I set my resistor load bank to pull a hefty 15 amps, and I let the speed controller run for 15 minutes without providing any cooling air. The Traxxas XL-1 got quite hot but kept pumping the 15 amps. If you plan to run modified motors on 7 cells in heavy trucks, make sure plenty of cool air can get to the speed controller. It's also advisable to let your motor and speed controller cool between hard runs.

(Continued on page 112)

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M14	Controller Set	20.00
M16	Connector Set	3.25
M21	Servo-Saver Set	3.25
M28	Differential Gear Set	7.00
M29	Pinion Gear Set	4.75
M30	Front Arm Set	8.00
M31	Rear Arm Set	10.00
M32	Rear Axle Set	10.00
M33	Bearing Set	4.00
M34	480 RS Tuning Motor	30.00
M35	Front Tire Set	23.50
M36	Rear Tire Set	23.50
M37	Bumper Set	5.50
M38	Adjuster	5.50
M44	Chassis	15.75
M96	Windshield	8.95
M97	Roll Bar	1.95
M98	Seat	4.95
M99	Body	21.00

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POLE POSITION

by RICH HEMSTREET

DON'T KEEP R/C CARS A SECRET



Gary McAllister's $1/10$ -scale Nissan is parked in front of Geoff Brabham's full-scale machine.

One of Brabham's crew hands him the Outlaw car as he sits strapped in his Nissan, ready to go out on the Del Mar track for practice.

LAST FALL, Gary McAllister took one of his Outlaw $1/10$ -scale cars to a full-scale GTP race in Del Mar, CA. He had a Nissan GTP body mounted on the car, and it was identical to Geoff Brabham's full-scale ride that was entered in the race. Gary didn't have the proper credentials to get into the pits, but his R/C car got him past security long enough to shoot a couple photos of his car with its big brother. One of Brabham's crew members grabbed the Outlaw and handed it to Brabham as he sat in the car, waiting to go out for a practice run. Gary thought that he was the only one taking pictures, but in the November 16, '89 issue of *On Track* magazine, there was a photo on the contents page of McAllister's Nissan sitting in front of Brabham's car.

So, what does all of this have to do with you?—plenty, if you're into R/C racing. The more exposure R/C racing receives in the full-scale arena, the bigger the sport will become. If you or your club ever has a chance to put on a display or a demonstration at any full-scale auto event, jump at it! Whether it's a race or an auto show, try to get involved. Many people don't



even know R/C cars exist. When you take your cars to these shows, pay close attention to the full-scale cars, and try to duplicate some that are on display or racing at the event. You could even detail your car to match some of the better-known full-scale racers, e.g., Richard Petty's STP Pontiac, Rick Mears' Pennzoil Penske or Brabham's Nissan GTP. Many full-scale auto enthusiasts will want to become involved once they know that high-quality R/C cars are available. It's

up to all of us to make people aware of our sport.

Pole Position National Championship

It's over! I can finally toss out the 8-month-old race results. The '89 Pole Position National Championship (PPNC) is now history. You may recall that last spring I decided to use the results from the four major, $1/10$ -scale, paved-oval races to name three national champions.

POLE POSITION

The races were: TRC/Trinity Challenge at Lake Whippoorwill; ROAR Paved Oval Nationals at the Peach Bowl; RC Thunderdrome; and the *Car Action* Weekend at Lake Whippoorwill. I hope that this championship will serve as a prototype for a formal national series in 1990.

The way the points were set up made it crucial for the drivers to compete at all four races, if they were to do well. Very few drivers in the amateur classes could make it to all the races, and only two stock-class drivers made it to all four events: Ricky Jordan scored 778 points to win the championship over Matt Cupka. Kevin Lanier, the top qualifier and A-Main winner at the first two events, missed the Thunderdrome race. Lanier's B-Main victory at the *Car Action* weekend secured him 3rd place. If Jordan and



Ricky Jordan won the PPNC Amateur Stock title with an A-Main victory at the *Car Action* Weekend.

Cupka had both missed the Thunderdrome, Jordan would have still won over Lanier, but only by one point: 588 to 587.

In the PPNC Amateur Modified Class, Hoyte Stacey won an easy victory. Stacey was the only driver to race in all four Amateur Modified races. Some drivers who started off in the Amateur Modified Class switched to the Pro/Invitational Class before the season was over. Stacey's win required a great deal of travel, as none of the tracks were even close to his home state of New York.



Kent Clausen won the '89 Pro PPNC with four consistent A-Main finishes.

Stacey finished with 694 total points.

In the PPNC Pro Class, several drivers showed up for every race. If the RC Thunderdrome hadn't taken place the same week as the IFMAR Off-Road Worlds, there probably would have been several more drivers with perfect attendance. Kent Clausen took the lead at the second race of the series and held it to the end. With a 778-point total, Clausen won the '89 Pro Pole Position National Championship. Tony Neisinger finished 2nd overall, 19 points behind Clausen, and Bud Bartos rounded out the top three spots with 749 points.

In conjunction with the PPNC, I also ran a Chassis Manufacturers Championship. In this case, each manufacturer's highest finishing A-Main chassis received points. There was also a bonus point for the top-qualifying chassis in each class. I had predicted that at least 10 manufacturers would earn points by placing their chassis in at least one A-Main. Although I was right about the number, I'd have been way off if I'd attempted to guess which 10 or 12 manufacturers would earn points. Associated won the CMC with its 10L.

As the series went on, the number of 10Ls increased rapidly. Composite Craft used a strong showing of its new Lynx II at the *Car Action* Weekend to edge

Bolink out of the 2nd-place position. Bolink finished in 3rd place, and TRC took 4th.

Here's the complete rundown:

1.	Associated	72
2.	Composite Craft	68
3.	Bolink	64
4.	TRC	50
5.	Vicfor	15
6.	Hyperdrive	14
7.	McAllister	10
8.	PRC	8
9. (tie)	Advance Racing Tech	6
	Thundercar	6
10.	MRP	2
11.	R.C. Inovations	1

That does it for the '89 Pole Position National Championship. I can assure you that there won't be a 1990 PPNC, as the paperwork and cross-checking of all the results is far too time-consuming. Congratulations to the first and only Pole Position National Champs: Kent Clausen, Hoyte Stacey and Ricky Jordan.

Next month, I'll get technical about some aspects of on-road handling, including the frequently misrepresented Akerman free-steering setup. I hope to have some good news about a Pro series taking shape for this summer. Until then, try to keep it shiny side up. ■

TOO HOT TO HANDLE



MY OBSESSION WITH the Kyosho* line of monster trucks began when I wrote the *Car Action* track report on its gas-powered 2WD Nitro Brute. Since then, I've written several track reports and added several new models to my collection of Kyosho trucks. Of all my models, I prefer the Kyosho Double Dare. It's one of the most affordable and versatile trucks on the market, and it includes a long list of standard features,

e.g., full-time 4WD, 4WS, dual motors and a highly detailed body. So when the master of the *Radio Control Car Action* project series, Steve Pond, mentioned that he was interested in doing the Project Double Dare, I was quick to convince (or beg) him that I'd be the best person for the job.

You can always tell when an R/C model has gained popularity because, shortly after its release, several aftermarket hop-up parts suddenly appear. The Double Dare is a good example of this phenomenon. The basic design is sound, but there's room for improvement, especially in the areas of wheel hub strength and suspension. As I reported in my review on the Double Dare (in the April '89 issue of *Car Action*) the front-end steering blocks broke under normal driving conditions. Kyosho seems to have rectified this weakness by introducing a stronger composite steering block, which was incorporated on my

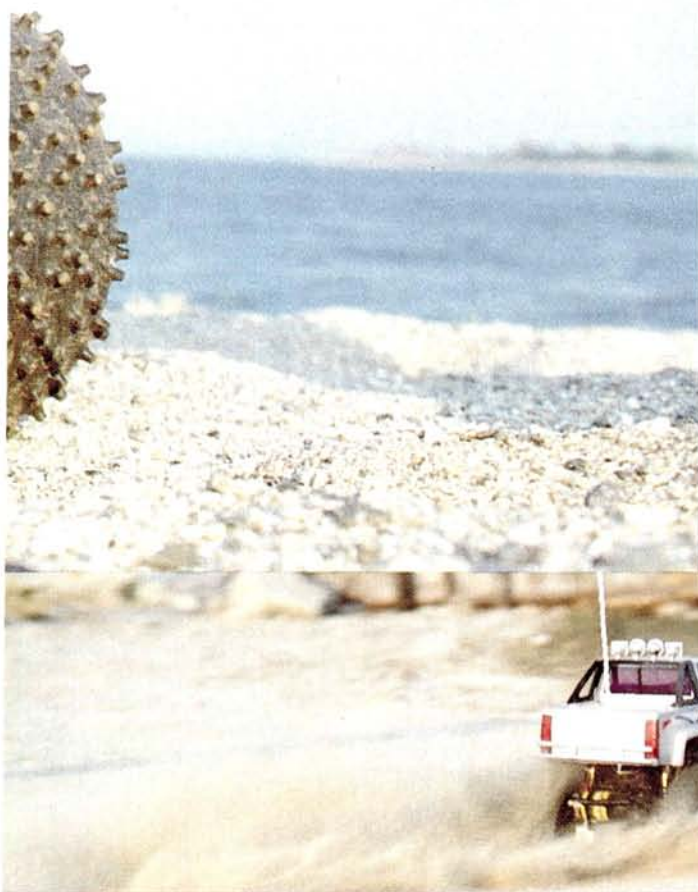




PROJECT DOUBLE DARE

by JOE BRUNI

PHOTOS BY STEVE POND



project model and so far, there are no signs of cracking or breaking. Next, I added a set of competition shocks, because the stock spring-dampened (if you want to call it dampening!) plastic shocks offered neither adjustment capabilities nor the opportunity to choose a variety of oil viscosities, which can dramatically alter shock performance.

Transformation

In transforming my Double Dare, the most important step

PARTS

THORP

Big Brute differentials (2)	4800
Big Brute dogbones (4)	4825
Big Brute axle (4)	4826
Big Brute counter gear (2)	4820
Big Brute idle gear (2)	4821

KYOSHO

Double Dare precision ball bearings	H-012
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Hobbico/DuraTrax

Big Brute diamond-spike tires (4)	DTXC9210
-----------------------------------	----------

TEKIN

ESC 600PXT speed controller	
-----------------------------	--

Trinity/Speedworks

Monster Mash (forward)	0008
Monster Mash 2 (reverse)	0009
Sport Pack KR-1300sc	0011

IMEX

Best Quality long shocks (8)	2006
------------------------------	------

FUTABA

Magnum Junior	2PBKA
---------------	-------

LIST

DOUBLE DARE



The only visual evidence of the hi-po goodies on the Double Dare are the shocks and the motors, but what's under the hood also counts.

in improving the performance was the addition of a complete set of Kyosho precision ball bearings. It's true that a full set of ball bearings is somewhat costly, but ball bearings markedly decrease frictional drag and prevent premature wear, thus decreasing the future cost of parts replacement.

The Double Dare sports a twin-differential design. Both the



This pair of Monster Mash motors and the 1300mAh battery pack deliver excellent performance for the buck.

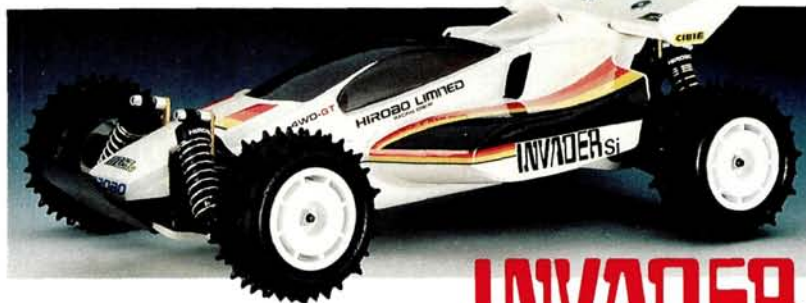
front and rear diffs are constructed as mirror images, so buy two sets of all replacement diff parts. Thorp Mfg.* is the place to go for race-proven, high-tech diff components. Thorp produces a complete line of diff products for almost every car on the track. Since the Double Dare uses exactly the same diff system as its cousin, the 2WD Big Brute, I used Thorp Big Brute parts. Aside from the main Thorp diff, I also replaced the idler gears, the counter gears, the axles and the dogbones. While most of the original equipment is plastic, the Thorp replacement-diff conversion package is constructed of steel and nylon and, best of all, it can be totally adjusted trackside

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Quality Car Kits

The Alien Mid SS and the Invader from Hirobo are high quality kits capable of top finishes at every level of competition, yet durable enough for neighborhood fun. The mid-engine design offers good weight distribution and the lightweight plate-style chassis gives plenty of protection. Fourteen ball bearings, 3-speed foil-type speed control and belt drive help prevent breakdown and allow top end performance. The oversized shocks add 70% more shock absorption than the competition. Aerodynamic, two-piece lexan bodies have a futuristic appearance that catches the eye of everyone at the track. The Alien Mid and Invader from Hirobo are sure bets to catch the checkered flag at your next race!



INVADER

ALIEN MID



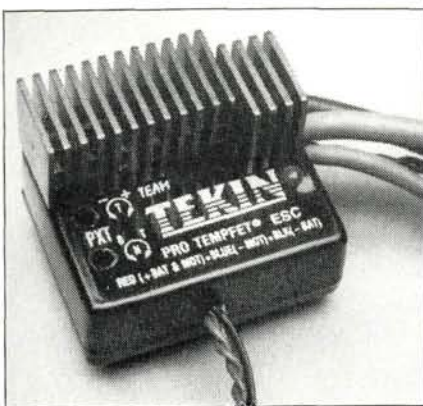
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- 3 gear ratios
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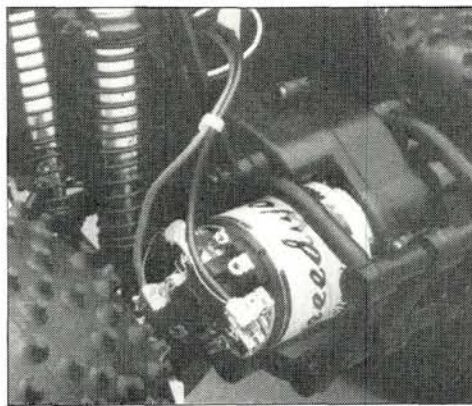
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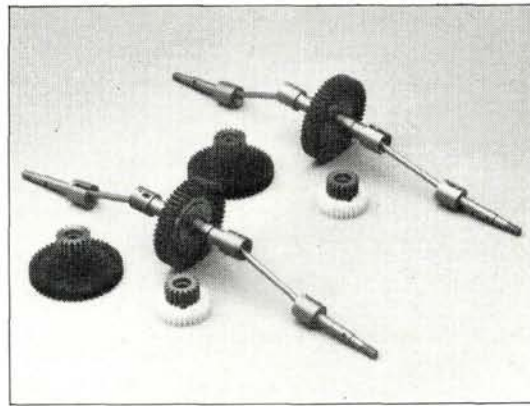
hobby Dynamics



The top-of-the-line Tekin ESC 600 PXT employs the latest TempFET technology, and it's more than capable of handling the current demands of twin-motor trucks.



The Speedworks Monster Mash motors provide plenty of torque and speed for the Double Dare, while the IMEX shocks soak up the bumps.



The Thorp ball differentials and heavy-duty replacement gears transmit the power to the ground more efficiently than ever with the stock hardware.

with the Allen wrench that's included. To install the Thorp diff, you'll need to disassemble it, but be careful not to drop the steel balls, which are crucial for proper performance. After placing all the components in the diff housing, don't forget to add a small amount of good-quality lube to all the meshing gears. Once both halves of the housing are united, test the diff by grabbing the universal joints. If assembled (or, for that matter, reassembled) properly, you should feel some resistance when you rotate the universals in opposite directions. There shouldn't be any rough spots or grinding sensations during rotation. If there are, the steel balls below the thrust bearing might be out of alignment, or the diff could be too tight. Once properly assembled and adjusted,

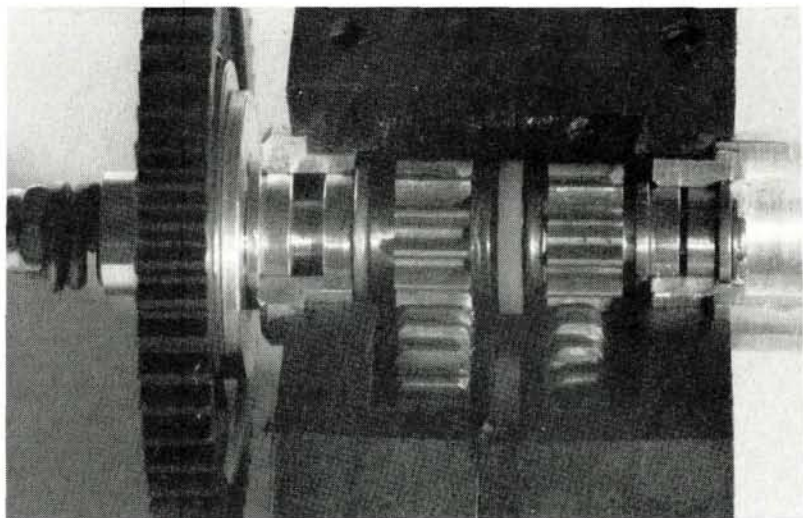
the diff should operate smoothly and shouldn't slip too much under acceleration.

Initially, I thought that finding a direct replacement for the original shocks would pose a problem, but another Double Dare fanatic told me that he replaced his stock shocks with eight IMEX* Gold long shocks. After examining his truck, I bought four sets (there are two in each package). Assembly requires a needle-nose pliers and is straightforward. Each set of shocks has its own bottle of oil, as well as several dampening piston heads and spring tensions from which to choose. I chose the two-hole piston and the softer black springs. To simplify mounting, I used

(Continued on page 146)

RM 310 IMPROVED BEARING ADAPTOR KIT FOR RC-10

This package contains the large adaptor which will accept 2@ 1/4 x 3/8 flanged bearings, the small adaptor which will accept 2@ 3/16 x 5/16 flanged bearings, and a plastic dust plug which is designed for a snug fit to maintain a dirt free transmission. Both adaptors are machined from 6061 AQ aluminum, within extremely close tolerances. These adaptors absolutely will not wear out or become distorted the way molded plastic ones do. Also, this setup (Alum. adaptors and 4 bearings) virtually eliminates end play and flex in the top shaft, providing a tighter gear mesh and less friction for a smoother, more efficient transmission.



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NR/CTPA
TRUCK PULLS
WORLD CHAMPIONSHIP

by WALLY DAVID

Pullers Converge on Champaign

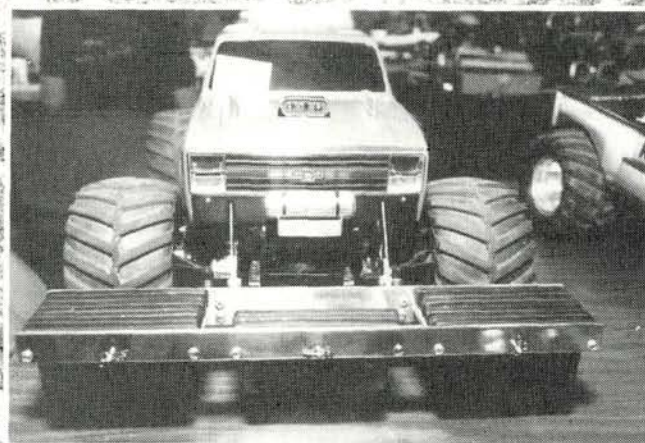
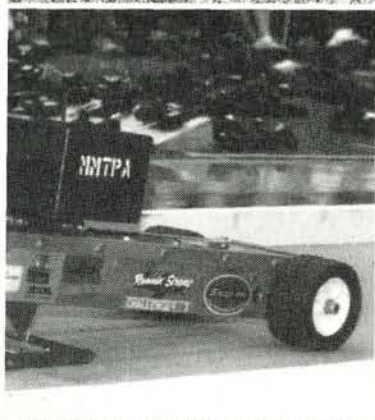




THE BEST IN the world—that's what "World Championship" means. I don't know of any major R/C truck-pulling organizations in other countries, so the 1st Annual NR/CTPA World Championship R/C Truck Pull probably did draw the world's premier pullers.

Held at Parkland College in Champaign, IL, in mid October '89, and sponsored by Car

Action and Kyosho, the World Championship drew 183 entrants, who included 148 pullers and 35 monster truck racers. These drivers came from 21 U.S. states, Canada and New Zealand. To show pullers and spectators what's new and exciting on the R/C pulling front, a number of companies were on hand with product exhibits—Kyosho, Parma, Advance Engineering, R/C Research Engineering (Black Magic Motors), C&S Manufacturing and more.



NR/CTPA TRUCK PULLS WORLD CHAMPIONSHIP

When most people think of truck pulling, they envision heavy vehicles pulling incredible weights. Some R/C organizations put most of their emphasis on the crazy, unlimited classes and the heavy weights they pull. Consequently, beginners and those who just want to have some pulling fun have shied away from this area of R/C competition.

By requiring lighter vehicles, limiting the number of motors and batteries and using lighter weights on the pulling sled, the NR/CTPA emphasizes the setup of the pulling vehicles: weight balance, traction and durability are of key importance. By putting equal emphasis on the lighter classes, the NR/CTPA encourages all participants to appreciate the importance of every class, and this encourages new people to get into the hobby.

Up and At 'Em

Things got under way bright and early on Saturday morning: registration and tech inspection at 8 o'clock, followed by the opening ceremonies at 10, and the first round of pulling at 10:30. After a round of monster truck course competition, there was a second round of pulling.

Sunday brought a third round of pulls, and all pull-offs were held after the second round of monster truck races. Pull-offs occur when vehicles are tied after three rounds. They will usually have achieved full pulls, but this isn't always the case.



Above: Sponsor banners were plastered all over the walls of the pit area at the World Championship.

Below: Alf makes sure there's enough weight on the front of this puller.



Let the Pulling Begin!

- The 2WD Stock Class is for real beginners, and it's easy to prepare for it, because you can't do much to your vehicle. The chassis,



**Fighting
Kiwi**

IF YOU EVER travel to New Zealand, remember to bring your pulling truck: by the time you read this, a chapter of the NR/CTPA will probably be going strong there! •

Nineteen-year-old Stephen Carmine, of Wellington, New Zealand, is such an enthusiastic truck-pulling fan that he took a two-week vacation to compete at the NR/CTPA World Championships. He easily won the Long Distance Travel Award.

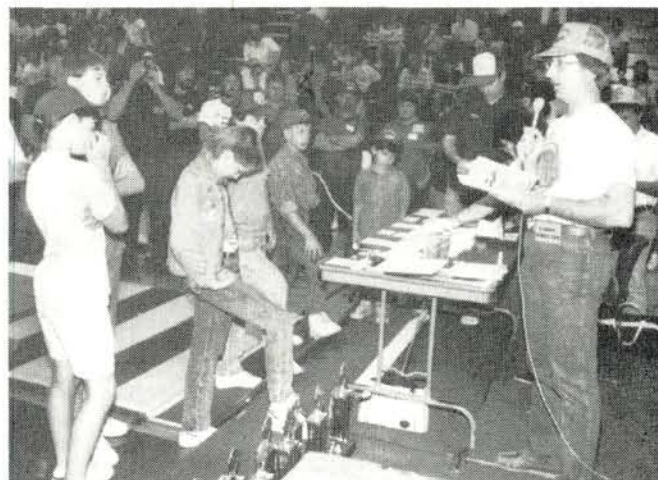
Steve's hosts were Dave and Cheryl Sproul, NR/CTPA President and Secretary/Treasurer, who live in Champaign, IL. Steve wouldn't have been able to afford the airfare and a hotel, so the Sprouls graciously invited him to stay with them. Now, that's true international spirit!

Steve was one of the most enthusiastic pullers in attendance, and he could be seen lending a hand wherever needed. If something had to be done, Steve was ready and willing!

How did Steve do in the competition? Not too well, as he was plagued by mechanical gremlins throughout the weekend. His lack of success, however, never dampened his enjoyment of the event! Steve says he'll be back next year, and he hopes to win a few classes.

Rumor has it that Steve will apply to host the Third Annual World Championships in Wellington in September 1991. I hope I'll be assigned to cover it for *Car Action*!





Above: The gym at Parkland College was bursting at the seams for the finals on Sunday. Above right: Dave Sproul, President of the NR/CTPA, conducts the drivers' meeting to lay down the law! Below: This high-flyin' truck clears some of the car bodies used in the monster truck competition. Below right: After the competition on Saturday, Bill Jeric, Kyosho's Merchandising Manager, conducted a motor and battery seminar at Superior Hobby Supply.



gearbox and suspension must all be original; no additional gearboxes are allowed, and only the pinion gear can be changed. The suspension may be locked.

The vehicle shouldn't exceed a length of 22 inches (including hitches and weights) and a width of 13 inches, and the wheelbase may not be altered. The maximum allowable weight is 5

STOCK AND MODIFIED WINNERS

FIN	DRIVER	TRUCK	TRUCK NAME	MOTOR	# OF CELLS	WEIGHT (lbs)	DISTANCE
2WD Stock							
1	Ruth Barnett	Monster Beetle	Hi Energy	LeMans 360ST	6	50	Full
2	Greg Arnone	Black Foot	Motorcraft Mauler	LeMans 240ST	6	50	29' 3"
3	Marcee Arman	Midnight Pumkin	Bad	Kyosho Mega	6	50	23' 9 1/4"
2WD Super Stock							
1	Dutch Esgro	Big Brute	Purple Haze	LeMans 360ST	7	75	28' 8"
2	Dutch Esgro	Black Foot	Wild Cherry	LeMans 360ST	7	75	28' 5"
3	Robert Stout	Big Brute	Full Pull	LeMans 360ST	7	75	22' 8"
Dual Motor Stock							
1	Dale Arman	Clod Buster	Pressure Point	Black Magic	7	135	24' 11 1/4"
2	Rob Choiniski	Clod Buster	Defiant	LeMans 360ST	7	135	20' 1"
3	Matt Wilkins	Clod Buster	Raz-Ma-Taz	Black Magic	7	135	18' 9 1/4"
2WD Modified							
1	Glenn A. Turcato	Big Brute	Equalizer	Black Magic	7	125	29' 7 5/8"
2	Jim Mazurek	Black Foot	(no name)	Astro Flight FAI	8	125	29' 5 1/2"
3	Michele Tash	Big Brute	Li'l Mutt	Astro Flight 05	8	125	24' 8 1/2"
4WD Modified							
1	Wayne Rydzy	Bruiser	Thunder	Black Magic	8	101	Full
2	Don Rainey	Bruiser	Red Baron	Black Magic	8	101	28' 10"
(No third entry)							

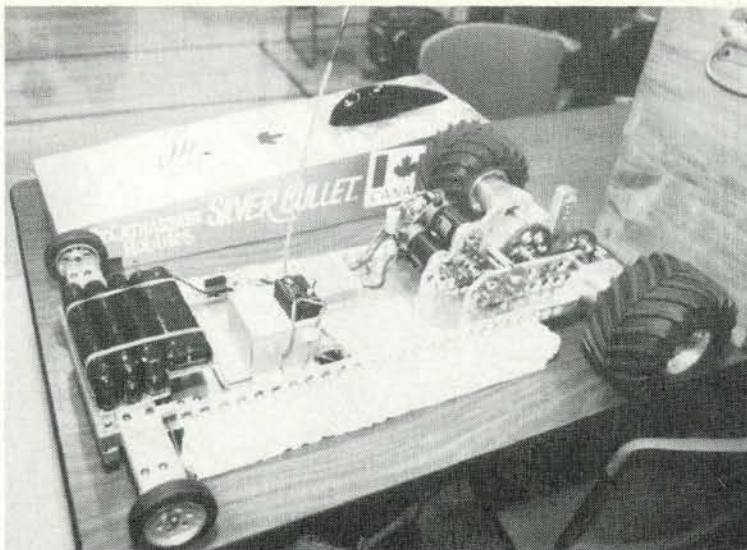
NR/CTPA TRUCK PULLS WORLD CHAMPIONSHIP

pounds, and power is limited to one non-adjustable motor with a suggested list price of no more than \$30, and a 6-cell battery with a 1700mAh maximum.

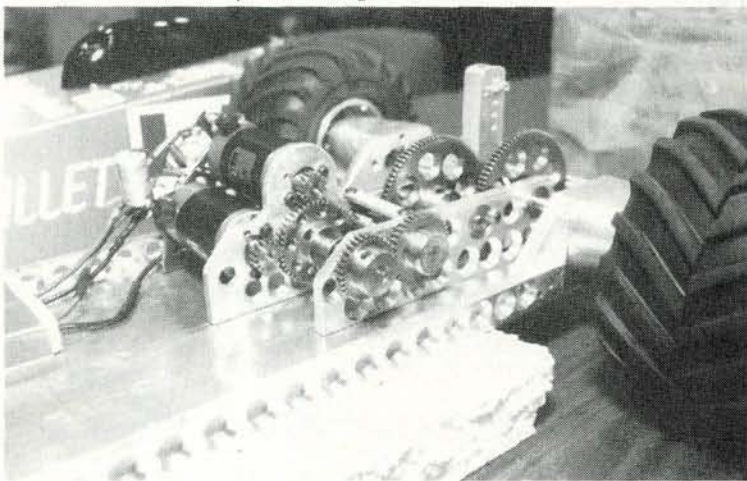
Tamiya cars swept the top three spots in this class, as Hi Energy—Ruth Battle's LeMans 360ST-powered Monster Beetle—pulled 50 pounds to a full-pull distance of 30 feet. The Motorcraft Mauler of Greg Arnone came in 2nd by going 29 feet, 3 inches. His Blackfoot's powerplant was a LeMans 240ST. Marcee Arman's Midnight Pumpkin—Bad—was 3rd, using a Kyosho Mega motor to pull the sled 23 feet, 9¾ inches.

● **2WD Superstock** is for those who want a little more power but still want to use a vehicle that's basically stock. The only differences between Stock and Superstock are that a 7-cell pack can be used and the weight maximum is 7 pounds.

Dutch Esgro took the top two spots in this class. For 1st place, he pulled 75 pounds to 28 feet, 8 inches with a LeMans 360ST-powered Kyosho Big Brute named "Purple Haze." His Blackfoot—Wild Cherry—also using a 360ST, came up just 3 inches short, with a pull of 28 feet, 5 inches. The Full Pull Big Brute of Robert Stout made it a 360ST sweep, as he went 22 feet, 8⅜ inches for 3rd.



The Silver Bullet, driven by John Dyke, had incredible power. The custom-machined transmission fed Astro Flight motivation to the massive rear tires.



An Advancement in Pulling

THE FULL PULL 2 made its debut at the NR/CTPA World Championship Truck Pulls. This new puller from Advance Engineering features a beautifully machined, all-metal transmission, which, unlike those of many other pullers, is very free and, when spun by hand, could turn almost forever! It has a two-plane chassis with a fiberglass bottom piece and an aluminum upper stiffener. The radio gear is mounted on the bottom piece, while the balancing weights are mounted on the upper stiffener.

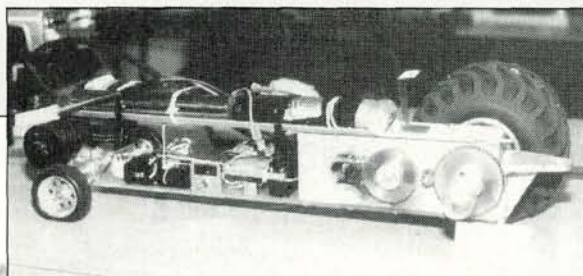
Tim Kulin of Advance was on hand to try out the Full Pull 2. Driver John Freed (who designed and built the Monster Mack that was featured in the September



Tim Kulin and Jon Freed work on the hitch of the Full Pull 2.

'89 and January '90 issues of *Car Action*) helped design this prototype.

After experimenting with hitch location most of the weekend, Tim and John found that the hitch seemed to work best when placed almost directly over the rear



The radio gear is located on the lower part of the chassis, while the batteries are strapped to the upper part.

axle. This puts most of the weight on the rear wheels and makes it harder for the front end to rise, as weight is transferred along the sled. If the hitch is located farther back, the rear axle acts as a fulcrum, so the front end easily comes off the track and causes a loss of steering and control.

By the time you read this, the Full Pull 2 should be available. Like many of Advance Engineering's products, this puller won't be inexpensive, but you can count on its quality of design, production and performance to be first-rate.

OPEN CLASS WINNERS

FIN	DRIVER	TRUCK	TRUCK NAME	MOTOR	# OF CELLS	WEIGHT (lbs)	DISTANCE
2WD Open I							
1	Charles Allen	Pro Puller	Flirtin' With Disaster	Astro Flight 12T	14	272	29' 8 ³ / ₄ "
2	John Walters	Scratch-built	Ground Pounder	LeMans 360ST	14	272	28' 11 ³ / ₈ "
3	Joe Kirkwood	Wedge	Jomama	Twister	14	272	28' 7 ³ / ₈ "
4WD Open I							
1	Dave Pennington	Javelin	Triple Threat	LeMans 360PT	14	138	Full
2	Ralph Cox	Optima	Shake Me	Kyosho Spa	14	138	21' 7 ¹ / ₄ "
3	John Spoul	Hi-Lux	Enforcer	Black Magic	14	125	17' 1 ¹ / ₂ "
2WD Open II							
1	Gary Kmit	Custom R/C Puller	Mellow Yellow	Astro Flight 05	28	350	23' 1 ¹ / ₄ "
2	John Walters	Scratch-built	Carpet Burner	LeMans 360ST	28	350	18' 4 ¹ / ₈ "
3	John Dyke	Scratch-built	Silver Bullet	Astro Flight 40	28	350	10' 8 ¹ / ₄ "
4WD Open II							
1	Larry Bennett	Pro Puller	Bennett Puller	Black Magic	27	275	29' 10 ¹ / ₈ "
2	Charles Allen	Pro Puller	Farm Toy	Astro Flight 05	27	275	27' 7 ¹ / ₄ "
3	Brian Sheler	Clod Buster	Bad Company	Astro/Black Magic	27	275	21' 6 ¹ / ₄ "

● **2WD Modified** is a production-based class, but competitors have some leeway to make changes. The chassis and gearbox must be original, but the gears can be changed as long as they fit inside the stock gearbox. This is the first class in which the wheelbase may be altered. The maximum allowable length is 24 inches; the maximum width is 14 inches; and the maximum weight is 14 pounds. Any R/C motor with maximum dimensions of 2-inch diameter, 3-inch length, and 3/16-inch-diameter shaft is legal. As many as eight cells are allowed.

The Equalizer—a Black Magic-powered Big Brute driven by Glenn Turcato—took the 1st spot, using only 7-cells to pull 125 pounds 29 feet, 7⁵/₈ inches. Using an Astro Flight FAI and 8-cells, Jim Mazurek piloted his Blackfoot to a 2nd-place finish of 29 feet, 5¹/₂ inches. Michele Tash, at the controls of an Astro Flight 05-powered Big Brute named Li'l Mutt, took the 3rd spot with a pull of 24 feet, 8¹/₂ inches.

● **4WD Modified:** Although there were classes for 4WD Stock and Superstock, Modified was the first 4WD class with entrants. Wayne Rydzy and Don Rainy (two friends from Wallingford, CT) were the only brave contenders, and they both had Bruisers powered by Black Magic motors! Wayne finished ahead of Don when his Tamiya Bruiser (Thunder) pulled 101 pounds for the full distance. Don's Red Baron Bruiser went 28 feet, 10 inches.

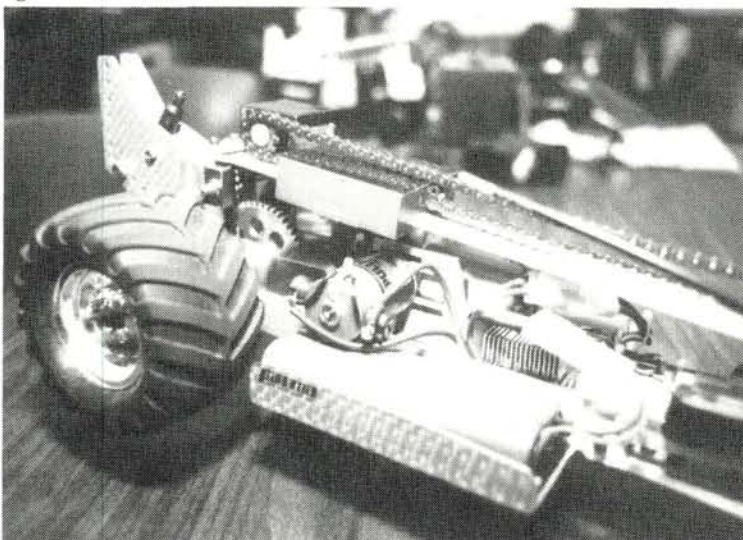
● **Dual Motor Stock** is limited to dual-motor production vehicles, e.g., the Kyosho Double Dare and the Tamiya Clod Buster. Other than Open II, Dual Motor is the only class that can use more than one motor; everything else on the 4WD dual-motor stock vehicles must follow stock rules.

Dale Arman, driving a Black Magic-powered Clod Buster named "Pressure Point," won the class by pulling 135 pounds for 24 feet, 11¹/₄ inches. Rob Shoinski's Defiant 1 Clod Buster used twin Kyosho 360ST motors to pull 20 feet, 1 inch for 2nd place. Using Black Magic motors, Raz-Ma-Taz, the Clod Buster owned by Matt Wilkins, pulled 18 feet, 9³/₄ inches for 3rd.

(Continued on page 168)



Louis DeGrose's scratch-built puller was a real eye-opener! It featured an automatic weight-transfer unit. A series of microswitches sensed when the front end of the puller started to lift off the track. The weight box in the vehicle was pulled forward by a chain, until the front wheels hit the ground again.



DIRT DIGEST

by BOB KANE & BILL O'BRIEN

"BAD BRAIN" BUYS A CLOD

BOB IS IN Las Vegas, so I have the column to myself. (He heard something about blackjack tables, grabbed a can of polyurethane stain and a brush and left with a mad gleam in his eye.)

It's been a tough month. I gave up working for a living and went back to freelance writing as my only visible means of support. Now, I'm forced to work two, sometimes three, whole days a week! To relieve my depression, I bought an CZ-R engine for my RS-200 and Tamiya's* Clod Buster. No wonder the R/C industry has grown so much.

I now have firsthand information on the Clod Buster chassis breakage points, and I thought it would be a good topic for this month's column.

Clod Busted

One look at the Clod Buster and you'll understand the true meaning of the word "massive." You'll also understand the meaning of the words "unsprung weight" when you note that the diffs, wheels and giant tires are attached to the chassis only by some pivot balls. There's no support for these sub-assemblies other than the eight pivot points, and the only anchorage for the pivot balls is the plastic chassis. Ouch! There are several reasons why a problem can arise. Although the eight spring dampers are long, they have a very short throw. To limit the shock travel, Tamiya tells you to use tubing on the shock rods, because the steering linkage exits the chassis at a very shallow angle. If the shocks were allowed to compress fully, the steering rods could easily contact the bottom of the chassis, and they could bend.

On a normally rough road, the bumps don't impose a heavy load on the pivot points. The springs have sufficient rebound to start the shocks moving away from the chassis almost immediately after it bottoms out. Also, the giant tires absorb much of the impact that the shocks



If you're into crushing cars and really thrashing your truck, the stock Clod Buster suspension will need some help. It can't stand up to the constant pounding of back-yard bonzai bashing! There are numerous after-market parts available to customize your Clod! This type of activity can be hazardous to a stock truck.



For normal touring, the stock suspension is great! The huge tires handle most of the bumps, and the shocks can deal with the rest. When you really push it, the stock setup has trouble standing up.

would usually handle.

Some of you, however, aren't satisfied with plain old dirt; you have to crunch cars and jump soda cans. The load to which this type of activity subjects the suspension is immense. During the time between when the shocks bottom out and the springs begin to push back, there's a lot

of pent-up energy in the suspension. Since energy can't be destroyed, but just has to live out its life, what happens?

Think of it this way: The ladder arms are like levers. The force applied from underneath pushes the arms up, and as you come down on top of a car or after a jump,

(Continued on page 88)

DIRT DIGEST

(Continued from page 86)

the pivot balls at the side of the chassis act like fulcrums. Now you've reached the end of the suspension travel, but the force of your landing hasn't been expended yet. Suddenly, the fulcrum point shifts to the shocks. The tires and wheels are still trying to go up and are compressing the suspension, but the shocks are holding them back. With the shift in fulcrum point, the pivot balls are now receiving the energy that's still trapped in the compressed suspension.

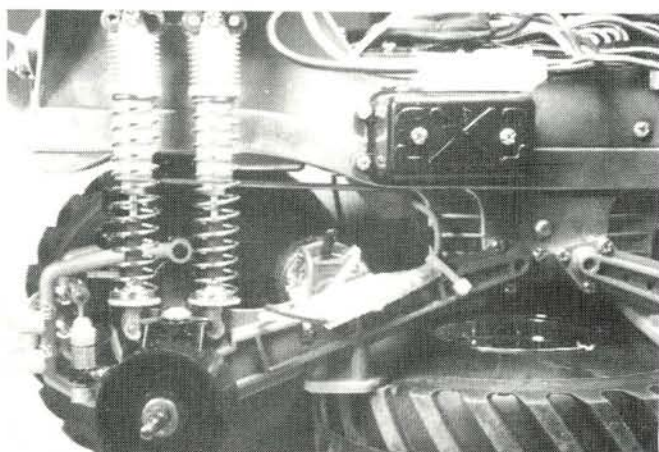
An ancient Greek once said, "Give me a long enough lever, a fulcrum and a place to stand, and I could move the earth." If you can move the earth, how hard do you think it is to move a puny thing like a pivot ball; and if the only thing holding that



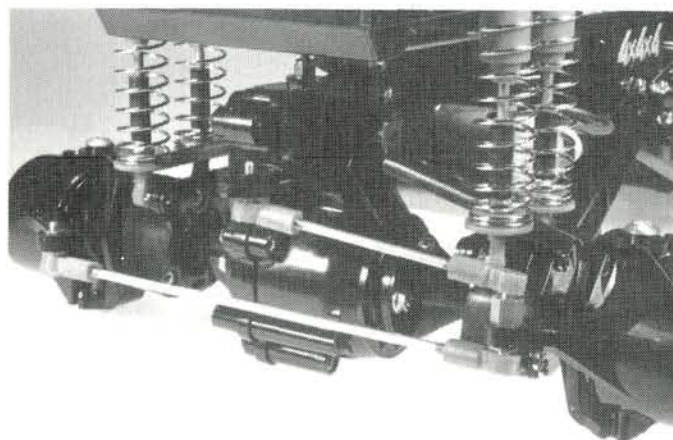
Imex Clod dual tires (right) are mounted on chromed-plastic rims, and their narrowness matches the dimensions of the original Clod tire. Now you can get dualies without having all that

sis-saver kit. There are quite a few available from companies like Aerotrend*, APM Hobbies* and ESP*, and they're basically all the same: they contain either a metal cage or separate metal panels for the bottom and sides of the chassis where the pivot balls are located. (I'm familiar with the Aerotrend kit, and it requires that you lop off the bottom plastic pivot-ball stud mounts. It's not difficult; just unnerving.)

It will take much more force to snap the ladder bar than to break the unprotected chassis. It might take that extra amount of force that you're going to apply once you feel smug about the security of the chassis. Anything will break if you push it hard enough and, in the process, push it beyond the limits it was designed to endure. It's not a negative aspect of the truck (or car) you own; it's more the negative way you treat your vehicle.



The Clod Buster ladder bars act as levers. When the shock is fully compressed, the system's remaining energy is transferred back to the pivot balls that hold the ladder bars to the chassis.



Installing the rod and pivot ball in the outside hole will increase the steering angle and improve handling.

pivot ball in place is some plastic, how long do you think the plastic will last?

The answer, of course, is not very long at all. If you continue to jump and crush with abandon, the combined effect of all the separate stresses causes the sides and/or bottom of the plastic chassis to split, and that's the damage most often found on the Clod Buster.

Now that you know the *cause* of the problem, what about the *cure*? Obviously, if you don't stress the truck beyond its design limits, you won't break anything. I know that I can't be that conservative, however, and I don't hold out any hope that you can be, either.

The other alternative is to install a chas-

Whether the saver kit has a cage or panels, the metal parts reinforce the plastic chassis. The pivot balls are mounted through the metal, and when the suspension applies pressure at the pivot points, the energy is spread across the metal inserts. Does that absolve you of all guilt and fear of breakage? In a way, it does, but I'm not sure I'd start smiling just yet. Remember those small metal triangles you complained so bitterly about because it was tough to align their screw holes with those in the ladder bars? Tamiya has had the foresight to reinforce the ladder bars that are connected to the side pivot balls, but the neck of the bar as it comes off the pivot is still vulnerable.

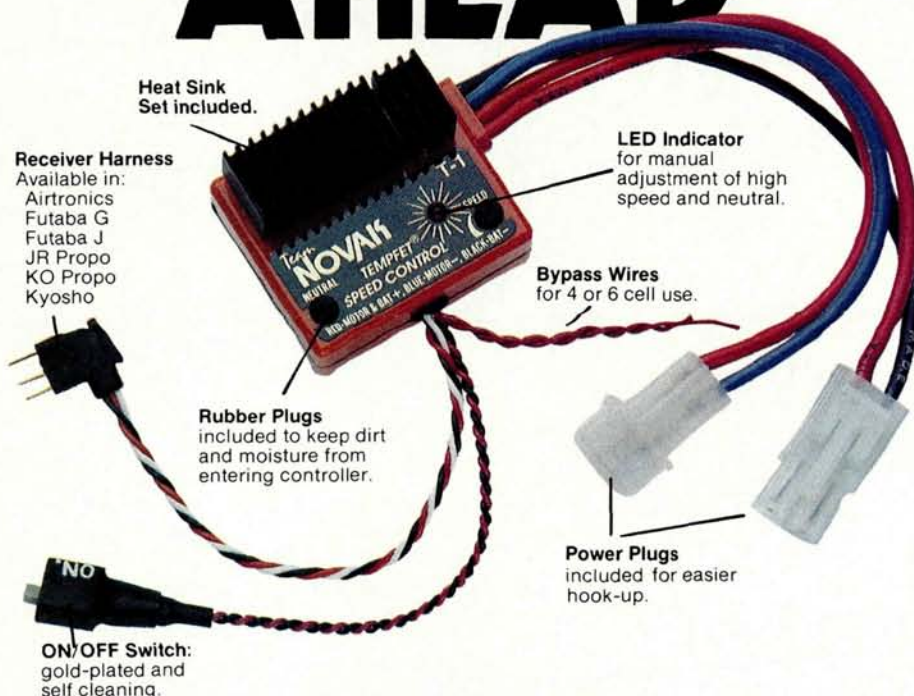
Clod Steer

If you own a Clod and haven't figured out the steering yet, or if you're uncomfortable with its wide turning circle, here's a tip. When you put a car into reverse and steer, the turning angles are sharper because the steering information is coming from the rear of the car. Literally, the front pushes the back, rather than trying to drag the rest of the car through a turn, as it does when it's running forward.

The Clod Buster's 4WS negates some of the rear-end drag, but the limited steering angle is what causes the wide turning arc. You can help increase the steering angle even more by increasing the throw

(Continued on page 174)

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Braking Power (A)	26	26	52
Response (msec)	15-20	15-20	15-20
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Motor & Battery Plugs	yes	yes	no

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RAMPAGE

(Continued from page 32)

been trimmed out. You need only cut the flashing off the edges and increase the size of the gas-tank access hole by following the lines, and you'll have a ready-to-paint body.

Fuel System

Small engines, like the .12 in the Rampage, can suffer fuel starvation if they aren't properly plumbed. The CZ-1 in a friend's Assault (an older Kyosho 2WD car) frequently died with a quarter tank of fuel still available, or it stubbornly refused to start.

Thanks to Kyosho technicians, the Rampage doesn't seem to have this problem. Not only is the fuel tank pressurized from the exhaust system, but there are also two, independent, manually operated pumps on the tank itself. Pressing one of the pumps primes the carburetor, while the other will shoot fuel directly into the cylinder.

With a live battery to fire the glow plug and good fuel (10 percent nitro seems to work well), you shouldn't have a starting problem. My experience runs contrary to the given instructions. I've found that two priming shots into the carburetor will usually start a warm engine and, if the engine is cold, an extra two shots are needed after a few yanks on the starter.

Firing Up

You need patience to start a glow engine, and most are fired with electric starters from beneath the chassis, so you have to hold the car up in the air.

The Rampage's recoil starter is great (simple, but great). To start a glow engine, open the throttle slightly; it's also good to set the trim off on the throttle servo and then use the mid point as the starting position for throttle. When the engine kicks on, it will be running at higher-than-typical idle rpm and the wheels will be turning. If the car isn't raised off the running surface, it could shoot away from you and out of control. (You can't use one hand to hold the car, because you need to yank the starter and handle the radio.)

Just keep the wheels off the ground, and you'll have plenty of time to grab your radio, reset the throttle to its idle position and adjust the mixture screw. (The manual gives excellent instructions.) You may need to apply the brake to stop the clutch from turning the wheels, but you only

(Continued on page 101)

TAMIYA

MUD BLASTER

TAMIYA
BUSTS
A
MOVE!



ONE OF TAMIYA'S* newest offerings carries the name tag "Mud Blaster." The Mud Blaster may be a new kit, but if you're familiar with the Tamiya line, you'll recognize this

truck as a close relative of the Blackfoot and the Monster Beetle.

THE KIT: The kit comes packed in a sturdy, colorful box (typical of Tamiya) that contains various screw bags and parts trees. Once you've put together all the A, B and C parts, you'll have a 2WD off-roader with a well-detailed, injection-molded Subaru Brat pickup truck body. The Mud Blaster is powered

by BILL HENNING

MUD BLASTER

TAMIYA

MUD BLASTER

Type Off-road monster truck
Scale 1/10
Sug. Retail Price \$166.15

DIMENSIONS:

Overall Length 17.75 inches
Width 11.25 inches
Height 9.5 inches
Wheelbase 9.625 inches
Front Track 9 inches
Rear Track 9 inches

WEIGHT:

Gross (w/bat.) 4 pounds, 5 ounces

BODY:

Type Subaru Brat pickup
Material Injection-molded plastic

CHASSIS:

Type Perimeter frame
Material ABS plastic

DRIVE TRAIN:

Primary Pinion/spur
Transmission Gear drive
Differential Planetary gear
Bushings Plastic bushings

SUSPENSION:

Front: Type Double wishbone
Dampening Coil-over shock
Rear: Type Trailing arm
Dampening Coil-over shock

WHEELS (F/R):

Type Plastic, one-piece
Dimensions (DxW) 2.5x2 inches

TIRES:

Front/Rear Rubber terra w/spikes

ELECTRICS:

Motor RS-540S
Battery 6-cell flat 7.2V (not included)
Speed Controller 3-step mechanical

OPTIONS AS TESTED:

Acoms Technisport Radio; Trinity Speedworks 1300mAh 6-cell Sport Packs.

COMMENTS:

If you know the Blackfoot and the Monster Beetle, then you know the Mud Blaster, which has inherited all the positive and negative traits of its cousins. Fortunately, it has also inherited all the good, available, after-market parts. It's a welcome addition to the Tamiya monster-truck family.

by an RS-540S motor and features four-wheel independent suspension. Semi-pneumatic spike tires 4.75 inches in diameter go on all four corners.

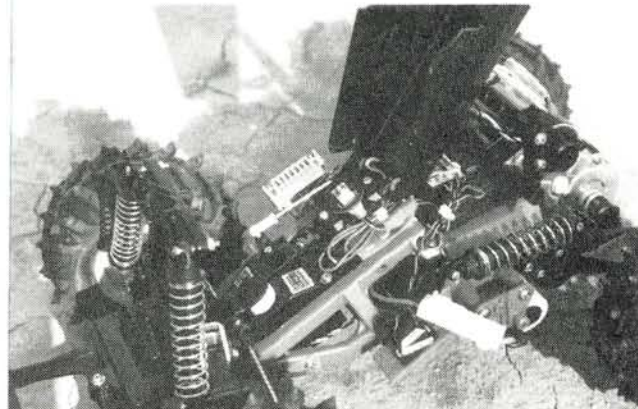
To get things rolling, you'll need a 7.2V rechargeable battery pack, a battery charger and a 2-channel surface-use radio system. I used an Acoms* Technisport Radio system, which features servo reversing, servo rate adjusters and a Ni-Cd charging jack. I also picked up a pair of Trinity* Speedworks 1300mAh Sport battery packs, which are excellent and affordable. I already had a charger, so I was ready to build.

ASSEMBLY: Before building, you'll need a few tools: medium and large Phillips screwdrivers, side cutters and an X-Acto knife. You'll also need thread-locking compound to keep the screws and nuts from vibrating loose. A box wrench, an Allen wrench, switch lubricant and grease are included in the kit.

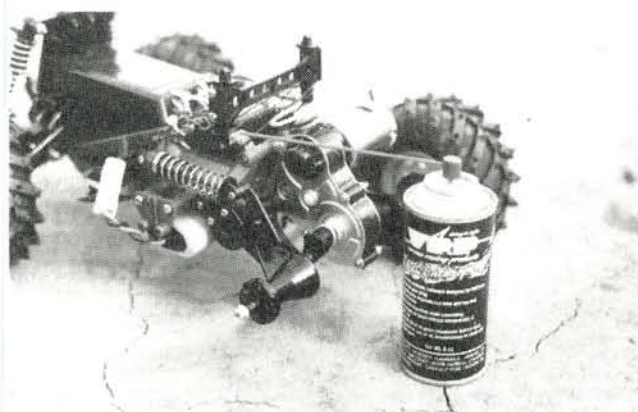
Start by screwing the two chassis halves together and installing the radio. The Acoms receiver is equipped with BEC, so I didn't have to use an extra set of batteries. After the servos, receiver and mechanical speed controller have been installed, assemble the front suspension.

Next, move on to the gear box, which features the same bevel-gear differential as the Blackfoot and Monster Beetle. To keep the gearbox running smoothly, I used Lubrispray from Verona Racing Products.* Designed for R/C cars, this synthetic lubricant reduces gear drag and improves the performance (and extends the life) of your gears.

The rear suspension and drive shafts are installed next. To my surprise, the kit included an extra set of half shafts. If that isn't an indication of what fails first, I don't know what is! I



The inner workings of the Mud Blaster are the same as those of the Blackfoot! Both have coil-over shocks that don't offer much in the way of dampening. The spiked tires are borrowed from the Tamiya Monster Beetle.



VRP's Lubrispray was used to keep the gears in the transmission operating efficiently. A smooth gearbox can increase run time and speed!

MUD BLASTER

think Tamiya should keep the extra half shafts and include Oilite bushings instead of the plastic ones, which cause problems. It's best to replace them with ball bearings right from the start. The coil-friction shocks are then assembled and installed, the motor is bolted in, and the tires are mounted.



Tamiya seems to have recognized a problem with the dogbones: an extra set is now included with the kit. Oilite bushings would probably be a better solution, because they would remove transmission slop.

I always find it difficult to decide how to paint my model. This time, I took the easy way out and painted it to match the box, which is very unusual for me. I used Testor's* model paint; the decals are supplied in the kit. When I was finished, I had a good-looking truck.

PERFORMANCE: During the winter (especially in southeastern Pennsylvania), there are few open off-road tracks on which to try out a hot new truck. Some friends and I cleared the leaves, branches and other debris off our dirt track. We brought a couple of Blackfoots and a Monster Beetle, but we didn't

expect the Mud Blaster to "blast" the competition off the track, since it has the same chassis as they do.

After several battery charges and cups of hot chocolate, we reached some conclusions. One, it was cold outside! Two, all the trucks performed basically the same, but the Monster Beetle handled the jumps better because of its oil-filled shocks. The Mud Blaster seemed to out-perform the two Blackfoots, but I think that was because of the difference between the drivers; the trucks are identical aside from the body. I suppose the spike tires helped and the VRP Lubri-spray did its job.

All this led to our third, and final, conclusion: truck racing is a lot of fun! I hadn't enjoyed racing that much in a long time. My only disappointment came the next day, after I put the truck on the top shelf in the store. Suddenly, I heard a loud crash. I turned to see the Mud Blaster on its back on the floor, the tires spinning wildly. The battery was still plugged in, and I had apparently left the truck on! Unfortunately, it suffered severe damage.

The Mud Blaster is a well-built kit; its instructions are the best on the market, and this makes it an excellent truck for inexperienced builders. Although it's virtually the same as the Blackfoot and the Monster Beetle, it gives you another choice in the Tamiya line of 2WD monster trucks. I suggest that you buy a bearing set, but I don't recommend that you drive the Mud Blaster off a top shelf!

**Here are the addresses of the companies mentioned in this article:*

Tamiya; distributed by MRC, 200 Carter Dr., P.O. Box 267, Edison, NJ 08818.

Acorns; distributed by Altech Marketing, P.O. Box 391, Edison, NJ 08818.

Trinity, 1901 E. Linden Ave., #8, Linden, NJ 07036.

Verona Racing Products, Inc., 4555 Groves Rd., #15, Columbus, OH 43232.

Testor Corp., 620 Buckbee St., Rockford, IL 61101.

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Andy's	Aristo-Craft	McAllister	MPE MRC	Traxxas	Trinity Twinn-K
Ascot	Associated	Miracle	Speedway MRP	Twister	Ungar You-G
Astro Flight	Autographics	Norcal	Novak Pactra	Universal Energy	Victor
Big Boy Toys	Blk Magic	Paragon	Parma Pitstop	WSS Inc.	Zeta
Blue Ribbon		Peak Performance			
Bolink B & R		Power Pak	ProLine		
Bondhus		Pro Cut	Protech Ram		
Bruline	Bud's Cheetah	Prog. Tech.	Protrack		
Cam	Checkpoint C&M	Race Co	Race Master		
CMW	Composite Craft	Race Prep			
Cobra	CRP Dan's	Racing Silks			
Dahm's	Delta Dubro	RC Perf. Spec.			
Dialed	Racing Products	Revtech	RPM		
Fine Design		Rochester Rcw.			
Five Star		Rockbusters	RPS		
Edge	Gonzo	Robinson	Racing		
Great Grease	Houge	Sassy Chassis	SRS		
Hot Trick	Hyperdrive	Sermos	Speedworks		
Jammin'	(J.H.) Products	Shirwa	Stage III T&A		
Imex	JG Kimbrough	Stormer	S.T. (Skis)		
J-Car	KO Propo KRP	T.A. Emerald	Industries		
KSC	Lazerlite Leisure	Team Hammer	Tekin		

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TROUBLESHOOTING

Welcome to "Troubleshooting"—and to our new format! If you're having a problem that your hobby shop or racing friends can't resolve, give us a shout at Car Action, and we'll see if we can chase down an answer for you. Questions should be of a technical nature and should be addressed to:

Troubleshooting, c/o Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897.

Our very first, history-making enquiry comes from **Luis Chang, of West Hartford, CT.** There should be a prize—but there isn't!

HE LEAKS!

I need your help badly. The shocks on my JR-X2 leak, and I want to know if there's any way to fix them. If nothing can be done, I'm interested in buying Associated's shocks, but there are four to choose from: 1.32- and 1.02-inch-stroke rears, and .71- and .56-inch-stroke fronts. Which two are used on the RC10?

Many readers have written about their leaking JR-X2 shocks, but I have two of the cars, and they don't have any leaks. To ensure that there's no flashing left to prevent proper seating, check the plastic cartridge where it seats against the aluminum housing. Trial-fit the shock, deburr the cartridge, if necessary, and assemble the shock according to the instructions.

To make the cartridge fit snugly to the shock body, a slight turn with an adjustable wrench (and I mean slight) should prevent leaking. To prevent O-rings from tearing and causing a leak, be sure to oil them in the cartridge before sliding the shock piston through. Often, oil that ends up on the wrong side of the O-rings during assembly is mistaken for a leak. Use a solvent to clean off oil on the piston and just inside the cartridge; then check for a leak.

It's possible that your cartridges are just worn out. Team Losi shocks are ex-

cellent, but the cartridges aren't designed to last forever. The O-rings in the cartridge prevent oil from leaking around the piston, and they help compensate for the increased volume of oil by sliding up and down in the cartridge when the piston is compressed in the cylinder. This double duty can accelerate wearing, but the shock's performance makes it well worth replacing the cartridges a little more often.



ILLUSTRATIONS BY RICK HOULE

Team Losi has also introduced new, fourth-generation cartridges for the shocks, and they're designed to be more durable and even smoother. Using the Associated shock isn't an option unless you're ready to make some modifications. I've seen the JR-X2 pistons successfully used in the RC10 shock body, but the Associated front shocks are probably too short for the JR-X2 and would limit its suspension travel. The .56-inch-stroke front shocks and 1.32-inch-stroke rear shocks are standard in the RC10 kit.

GEARING UP!

I have a modified Turbo Ultima with a Novak T-4 electronic speed controller, an NER2-X receiver, a 7-cell SC pack and a Trinity Monster Stock, but I may get a Joel Johnson modified motor. Does the new Ultima Hyperdrive system replace all the outer gears or just the pinion-center gear? If it doesn't replace all the outer gears, is there a way to adapt the RC10

system to the Ultima? Also, will the Associated TQ-20 tires fit onto the stock Turbo Ultima rims? **Michael Parker, Charlotte Hall, MD.**

The new Hyperdrive Ultima conversion replaces all the exposed gears on the Ultima and eliminates the center counter gear. This is just about the easiest, most effective conversion Hyperdrive has to offer for off-road cars.

With the stock-gear drive system, the counter gear allows the main diff gear to rotate in a clockwise direction to move the car forward. If you eliminated the center gear and somehow converted to a pinion and spur gear, the car would go backwards. With the Hyperdrive conversion, the belt acts as a counter gear with less friction and considerably less vibration, and a stock-motor plate can be used without using a reverse-rotation motor. With an RC10 conversion, either a reverse motor or a custom motor plate must be used.

Another gear-drive alternative is the Trinity Ultima underdrive and overdrive gear sets. With these gears, higher ratios for the hot modifieds and lower ratios for stock motors on larger tracks can be used.

The Associated TQ rear tires will fit the Kyosho rims, but the front Kyosho rims are too small for the TQ tires.

IN CONTROL!

Can I use a Novak T-4 with my Challenger 260 radio, and can I use a T-4 on a Thundershot? If not, what should I use? The T-4 on my brother's Pro Radiant with a Trinity 427 motor only lasts about 3 minutes. Hope you can help!

Mike Ruland, Crescent City, CA.

Novak says that it doesn't offer a speed control for the Challenger radio systems. It recommends that you make patch cord, or have your hobby shop make one to adapt a Challenger receiver plug to any one of the five plugs that are available on the Novak speed controllers. I've seen the

TROUBLESHOOTING

plugs successfully converted directly on the speed controller, but be forewarned: tampering with wires on the speed controller will void the warranty. Using the speed controller in your Thundershot shouldn't be a problem as long as you mount it where it will be well ventilated.

Your brother's car is another story. The T-4 you mentioned has little to do with the car's 3-minute run time, nor does the motor, provided he takes proper care of it and keeps it clean.

The gear ratio has the most effect on the run time of an R/C car. It sounds as though your brother has a pinion gear that's too large for use with a modified motor. Tell him to try a pinion that's about two teeth smaller than the one he now uses (assuming he's using 32-pitch gears).

Many other factors affect run time: how smoothly the drive train runs, the tension of the drive chain, the mesh of the pinion and spur gear, the charging and condition of the batteries, driving style—the list goes on.

DISCONTINUED

I'm looking for a spare gear to fit the car that was shown in your August, '89 issue. Could you tell me where I can find this part? **Jim Bates, Vista, CA.**



The car you refer to is the Tamiya Superchamp, which was introduced in the early '80s as a predecessor to the Tamiya Sand Scorcher. The Superchamp has been discontinued for some time, so finding parts will be difficult.

Assuming it's the spur gear you're looking for, check with the hobby shops to see if they still have the part, or try to modify a newer spur gear that uses a

similar mounting system.

The new Schumacher Top Cat 2WD and the Pro Cat 4WD use a similar type of mount and, with some modification, it's possible to make the gear fit. If you're really desperate, take the car and a sample of a standard spur gear to a machinist and have an adapter made.

QUESTIONS! QUESTIONS!

Does anyone make a wheel adapter for the Blackfoot to change its wheels to small ones? Is it true that ceramic paint is best for painting bodies because it stiffens the body and prolongs its life? Advanced Engineering has an adjustable body-mount kit that uses Velcro instead of body posts and clips. Do you think that Velcro can hold a body on a truck when it's going over a rough track with mega jumps?

Chris Carter, North Syracuse, NY

I'm not sure what you're after when you say "small" wheels. If you want smaller monster tires and wheels, the rims and tires from the Lunchbox will fit the Blackfoot without modification. Another alternative is to use a set of after-market axles that allow the use of the Marui Big Bear tires and wheels (available from Phoenix Model, 53 Trade Zone Court, Ronkonkoma, NY 11779).

If it's car tires you're after, the Blackfoot's design follows that of the Tamiya Frog, and it will accept the original wheels or any others designed for use with the car.

I've never heard about ceramic paint. The stock body on the Blackfoot is strong without reinforcement. A polycarbonate replacement body shouldn't be reinforced; it should be allowed to flex. You'll need a paint that will flex with the body and won't flake off; buy one specifically made for polycarbonates.

Advance Engineering does make a body mount that uses Velcro instead of body posts for mounting. With Velcro, the body looks clean, as there are no posts sticking through it, but these mounts shouldn't be used on your racing monster truck. The Velcro mounts were designed for Advance's line of street and drag machines and other custom or concours bodies where an invisible mount is desired.

FEELIN' JUMPY!

My JR-X2 is a great car, but every time I hit a particular small jump on my local track, it noses down and does five or six flips in the air. I've tried angling my wings differently, but it doesn't help. What should I do? Will more weight in the rear help, or am I just hitting the jump too fast? **Noah Padolefsky**



It doesn't sound as though you're having much of a problem. I don't know how the car is handling on the rest of the track, but it could be the design of the jump that's giving you trouble.

A larger jump with a very smooth transition will usually cause the least trouble. A small one with a very abrupt approach will be the most difficult to get over with any kind of consistency and speed. The rear of the chassis often connects with the ground because of the jump's abrupt "transition." This usually sends the rear end right up and over the front, and this seems to be your problem.

Set your car to handle the rest of the track, and if there's a trouble spot, learn how to drive it. Changing the shock oil and experimenting with spring tension may also help. I've found that 10W oil in the front shocks and 30W oil in the rear shocks work best for the track I race on. Acceleration, deceleration, or coasting will have a profound effect on how the car will fly over certain jumps. If there are others at the track who run JR-X2s, check to see what they're doing to make their cars run smoothly. ■

RAMPAGE

(Continued from page 90)

have to mount the body, pin it into place and go.

That, of course, is the *theory*, but if you're trying to run in heat and humidity, your experience might resemble mine. After a half hour of tugging on the recoil starter, I began to have misgivings about the Rampage; then I remembered my Kyosho Stinger and its CZ-R.

While the Rampage manual calls for the trim adjustment to be open 1 1/2 turns, the CZ-R is a wide-throated carburetor and actually needs the mixture cranked out 3 1/2 turns to start. After setting it properly, the Rampage fired up after a quick pump on the fuel tank and two pulls on the starter.

And then it died...and I started it again...and it died...and I started it again...and then it revved really high no matter what the throttle setting!...and then it died. Well, you get the picture.

I carefully inspected the carb and saw two places where fuel bubbled out. One leak was at the rear of the throttle and was easily fixed with a twist of the retaining nut. The other leak was on the mixture block itself; I field-stripped the block and then cleaned everything and tightened it all back into place.

While I was trying to re-attach the fuel line, I found a third problem: there was a nick in the line, and that was letting fuel out and air in. When the factory technicians assembled the engine and rear brace onto the chassis, they had somehow also managed to puncture the line. (Considering that they run the fuel line along the bottom of the chassis and then up and around to the front of the carburetor, this isn't difficult to do.) I clipped the line just below the hole and rotated the mixture block (with the fuel inlet) almost 180 degrees to avoid the nick. This worked, but re-joining that thin fuel line to the fuel nozzle was very difficult.

This time, when I yanked on the starter, it almost fired, but the pressure line from the muffler came out of the gas tank. It didn't seem to be held in by anything. Unfortunately, the CZ-R must be pressurized. I put the tube back into the gas tank's opening and applied a small amount of thread-locking compound (use one that's safe for plastics) to hold it in place and seal the opening.

Almost out of patience, I re-attached the glow battery, grabbed the starter and prayed to Saint Jude (the somewhat ob-

scure patron saint of lost causes). A quick yank was rewarded by a cough and a sputter—promising sounds! One more yank and the engine buzzed to life, holding a decent idle as I adjusted the throttle from my radio. It was alive!

Life in the Fast Lane

I used the first tank of gas to break-in the engine and set up the front end. While the camber of both front and rear wheels is fixed, toe-in/out can be adjusted with the steering rods. After breaking several rod ends, I've started to replace all the stock tie rods with Du-Bro* 4-40 turnbuckles. (They come two to a package, either with or without a wrench, and adjusting them is much easier and safer than prying a rod end from a ball socket and then trying to press it back into place.) Kyosho's 36.5mm specification for the rod length gave the Rampage just a little too much toe-in for my taste, and the adjustable rods were more than welcome.

With the second tank of gas, it was time for some serious road work. If I hadn't already run a car in which there was a CZ-R, I would have been amazed. The Rampage left my poor RS 200 with its .10 FP-B in the dust!

Its sound was outrageous. While the muffler does a great dampening job, there was no mistaking the engine whine as I whipped it through its power band. My only complaint is that hard acceleration caused enough weight transfer to sit the car back on its rear wheels. This was so severe that, until I had the hang of things, the Rampage had a great time doing donuts in the dirt; it was quite uncontrollable! Only if I squeezed the throttle—the way you'd squeeze a trigger to get off a clean shot—would the Rampage take off in a straight line.

When I had mastered that technique, I used two more tanks of gas. The Rampage is awesome: brought gently to top speed, it tracked straight and ran like a cheetah bringing down a gazelle. I found myself wondering if it was still under control; it's like a *rampaging* bull!

What's Next?

Great cars aren't bought, they're made, and the Rampage is no exception. One of the first changes I'll make will be to the shocks: possibly platins for the rear and reds for the front. Kyosho's platinum shocks have taken a bad rap; next to MRP's pressurized shocks, they're the best I've used, but they are complicated, and you must really think about what

(Continued on page 110)

**"...and here are the press-
ons I use."**

— Rich Muise



BODYSHOP WINDOWMASK



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**THE COVERITE
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MICRO-NITRO

RS-200

TRUCK CONVERSION

by BILL O'BRIEN

SO YOU THINK your monster is tough? Well, as of today, you own a *wimpy* truck! It's not really your fault; sometimes, things just happen. In this case, what's happened is the mating of Kyosho's* Ford RS-200 glow-powered multi-terrain car and a JG* monster truck conversion kit originally designed for the Optima Mid. It may not be a match made in heaven, but the resulting product will give you one heck of a good time.

Doctor Bad Brain and the Laboratory of Doom

A few months ago, I enjoyed using a JG kit to convert an Optima Mid into a snorter of a monster truck. At the time, it seemed that the parts should work on any Kyosho 4WD car (within reason); and at the time, I happened to see Kyosho's new RS-200 4WD—you know, the one that's powered by the O.S.* IOFP-B(K) glow engine?

Luckily for me, a quick inspection of the RS-200 revealed that the most critical parts—the drive washers—were the same as those on the Mid, and truck-wheel adapters for the Mid would fit. Likewise, the RS-200's front and rear hubs were nearly identical to those on the Mid. It began to look more and more promising; somewhere in the distance, a lightning bolt split the sky. "Igor!" I cried to my faithful assistant. "Fetch me the JG parts catalog; I have a monster to build!" (I don't really have an assistant. I was just caught up in the drama of the moment!)

I plucked a basic Mid conversion kit from the catalog. The one I chose includes wheel adapters to mount Tamiya Blackfoot pattern wheels, a front truck mount, a rear oval mount, and a bag of body posts with extensions. I also picked out JG's Blackfoot replacement wheels (more on them later), their Diamond Pin Spike tires, and a preprinted Ford F-150 body.

I was worried about ordering the preprinted body, because the one I got for the Optima conversion was a wild splash of colors—definitely *West Coast*, and I'm an East Coast kind of guy. Relief! This one has a more conservative tone, with only six or seven colors.

Child's Play!

Construction was child's play: the wheel adapters slip on; the wheels and tires cap them; and half the work is done. The body mounts did offer some challenge, as the Mid and the RS-200 don't have much in common as far as suspension is concerned. The JG rear oval mount is drilled to match the Optima rear shock tower, which is missing on the RS-200. I had to enlarge the original holes to the sides of the mount to make it fit.

The front truck mount was the real killer. The front shock tower on the Optima Mid is angled back toward the rear of the car. The JG mount is bent at a complementary angle to straighten the mounting platform for the truck body. The RS-200 has no front shock tower, so using the existing body posts on the RS-200, I tie-wrapped the JG mount into place. That still left the platform slanting slightly, and I cured this by sanding down a pair of body-post spacers to matching angles. It took about 20 minutes of eyeballing, but it worked.

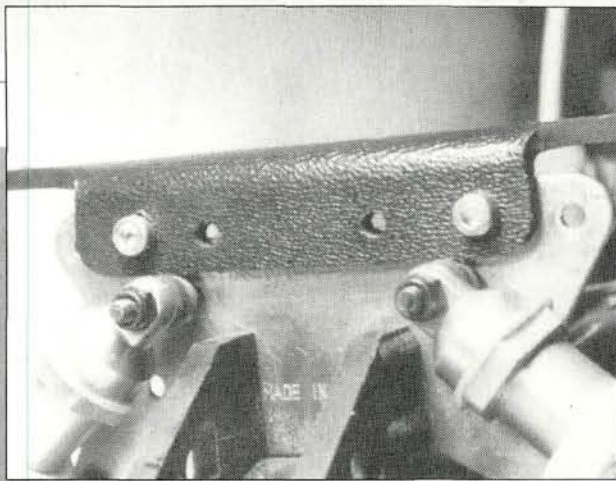
A few snips with a Lexan scissors, and the body was finished. I added some spare parts that were just lying around after other projects (chromed side pipes, rear bumper and roll bar), and I had a nice-looking gas-powered monster truck. Unfortunately, looks are only *half* the battle.

Down in the Mud

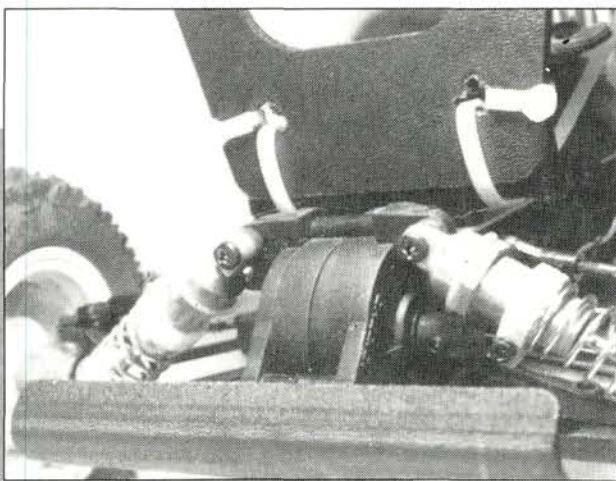
The RS-200 platform car I used is, at best, an asphalt racer; at worst, you could probably get away with running it on gravel, but the suspension definitely wasn't designed to do duty as a monster truck. During three afternoons of trial runs, the first change I made was to the springs.

The stock oil-filled shocks are serviceable, but I replaced the soft RS-200 springs with Blackfoot springs. The rears are stiff and the fronts are softer, but they're stiffer than the originals.

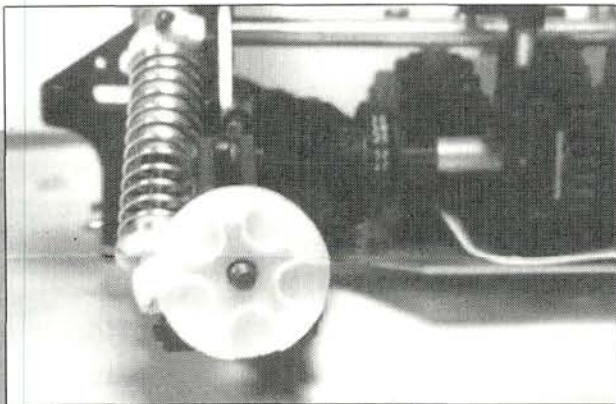
You'll also find that the front Blackfoot springs are too



The JG rear oval mount is meant for the Optima Mid, but it will fit the RS 200 if you widen the holes out to the edge.



Don't bother trying to bolt the front truck mount into place. Use the RS 200 mounting posts and tie-wrap the JG mount on the bottom and sides.



JG wheel adapters slip onto the RS 200 equipment, but the increased wheel offset is a problem. Direct-mount wheels will soon be available from JG.

long for the short RS-200 front shocks, but don't worry about it. They can be mounted (with the stock spacer still in place) at about one-third compression. It's fine; they work that way.

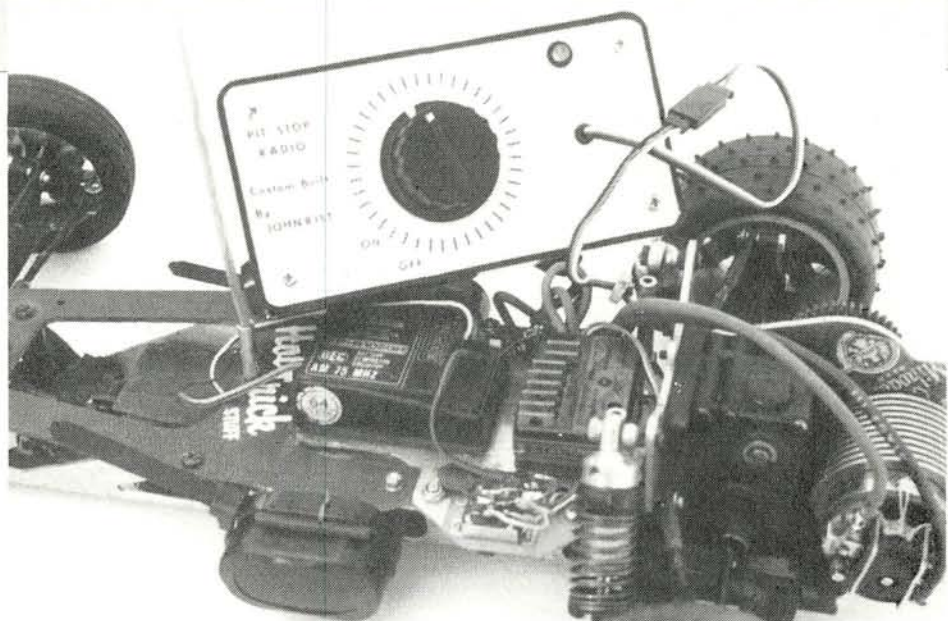
By the end of the first afternoon, the front-wheel bushings had just about had it; there was enough play in the wheels to turn the truck without turning the steering link-

(Continued on page 194)

BUILD YOUR OWN PIT STOP RADIO

Fine-tuning while your transmitter is impounded

by JOHN RIST



Use the Pit Stop Radio to check your electronic speed controller and steering servo. It's small, so it fits easily into your toolbox.

AT MAJOR R/C car races, transmitters aren't allowed in the pit area; in fact, they're impounded when they aren't in the hands of the drivers who are battling it out on the track.

Not having my transmitter in the pit area always gave me a headache when I tried to figure out how to prepare my car for the next heat—especially if I'd suffered crash damage or motor failure. After some research and a look at the output of a receiver, I determined that the signal that drives a servo is a 1-millisecond-wide

pulse that varies $\pm .5$ milliseconds. This is in the audio range, so a device that puts out this signal will control a speed controller or steering servo without disturbing any of the cars hammering it out on the track. After a little tinkering, I came up with a circuit that would duplicate the signal coming out of a receiver. With some refinements and a packaging job, I had my Pit Stop "Radio."

The Pit Stop Radio is battery operated

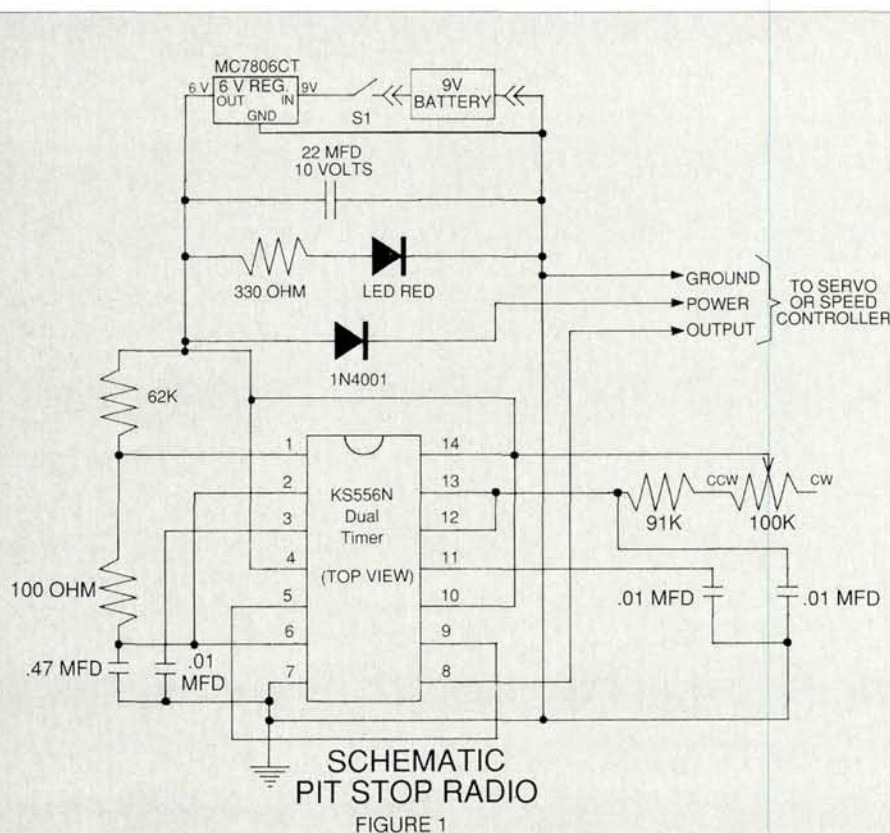
and small enough to fit in my toolbox. It can operate either a steering servo or an electronic speed controller. Its design is based on the KS556N integrated circuit, which is a dual timer (see fig. 1). To provide the basic overall timing, the first timer (pins 1 through 6) runs at a constant 60Hz. The second timer (pins 8 through 13) is wired as a one-shot to provide the $1 \pm .5$ -millisecond pulse. The pulse width of this one-shot is controlled by the 100K pot. You can plug your electronic speed controller or servo directly into the Pit Stop Radio and control them without using a transmitter.

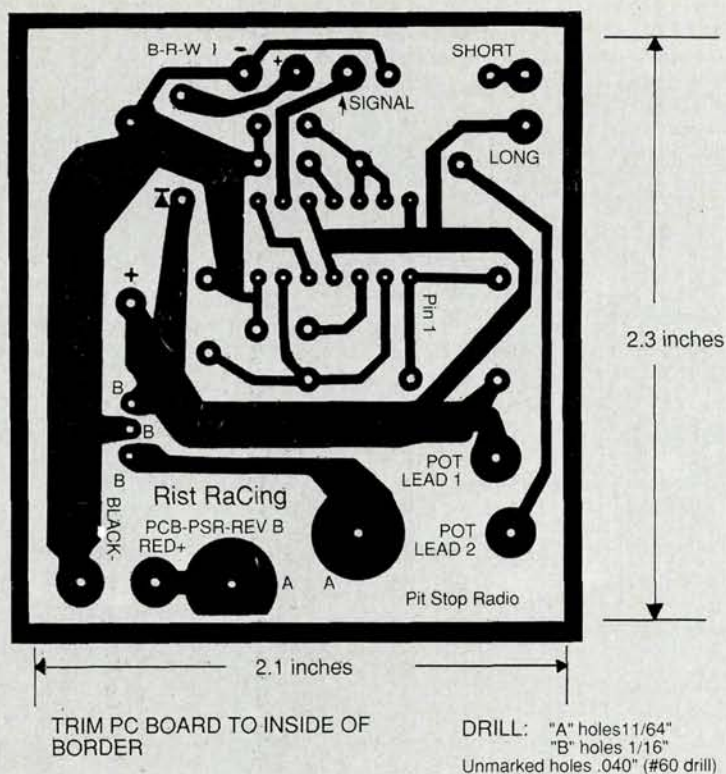
Etching the PC Board

To make the printed-circuit board (PCB), draw the pattern on a copper-clad board and etch away the unwanted copper. The blank copper board and the etching solution come in a Radio Shack PC Board Kit.

The pattern is transferred to the board using Radio Shack's Direct-Etch Dry Transfer rub-on decals. The Direct-Etch Dry Transfer kit contains four sheets of rub-on decals in the shape of circles, stripes, and integrated circuit (IC) pads. Simply clean the copper-clad board and transfer the pattern by using the rub-on decals (see fig. 2).

The hole spacing for the timer IC and the 6V voltage regulator has to be on a fairly accurate .1-inch grid pattern. You can accomplish this by locating the matching pattern on the dry transfer sheet. To establish the KS556N IC hole pattern, transfer two rows of seven pads to the copper board. The MC7806CT voltage regulator needs one row of three pads to





ARTWORK
FIGURE 2

establish its hole pattern. With the exception of the two largest pads, the spacing of the rest of the parts isn't critical. These pads must line up with the lugs of the on/off switch, which are located on the back of the pot. Use the switch as a pattern to locate these two holes.

Double-check your layout to make sure that the parts are connected correctly. To etch, follow the instructions in the Radio Shack PC Board Kit. *Be careful not to spill the etch solution*, because it's quite strong and could stain or damage anything it touches.

The last part of this step involves drilling the holes in the board. The two holes marked "A" should be drilled with a 1 1/64-inch drill. The three holes marked "B" should be drilled with a 1/16-inch drill. The unmarked holes should be drilled with a .040-inch, no. 60 drill. Alternatively, a finished board is available from Rist RaC-ing*.

Installing Parts

The assembly drawing (fig. 3) shows the location of the parts as viewed from the component side. Four parts can be installed backwards: the KS556N timer, the MC7806CT voltage regulator, the 1N4001 diode and the 22 MFD capacitor.

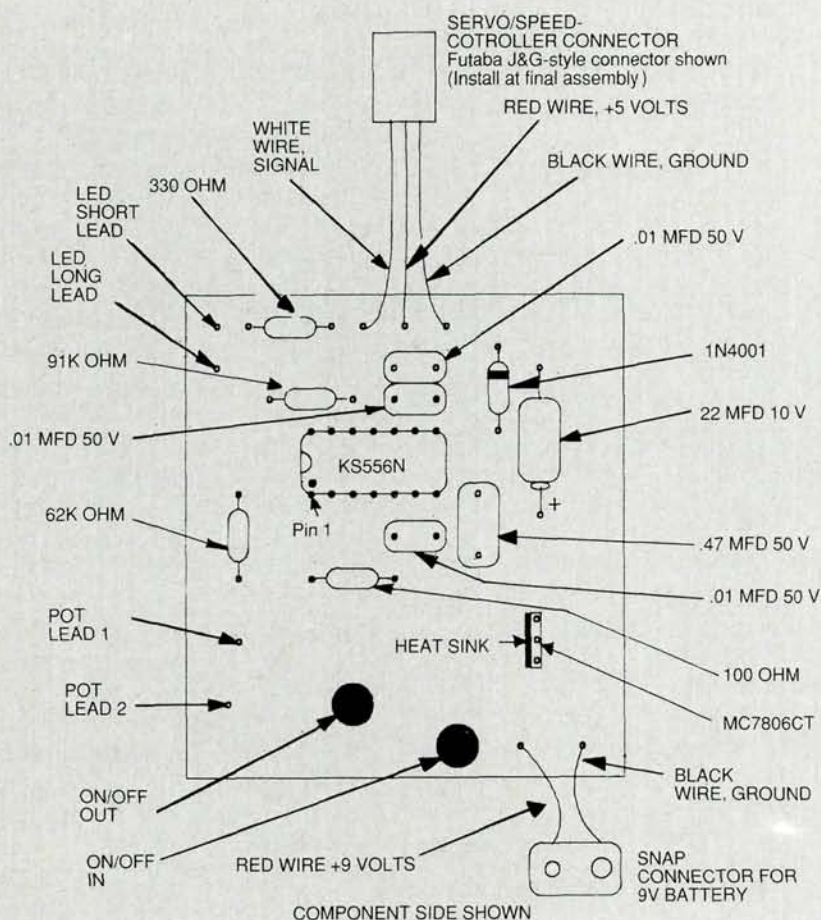
The KS556N timer will have a notch in the pin 1 end of the part, or it might have a dot next to pin 1. The voltage regulator has a metal heat sink on one side. Place the heat sink as shown in figure 3. The diode has a band or stripe on one end, and the location of this band is shown in figure 3. The 22-microfarad (MFD) capacitor will have either the + (positive) end or the - (negative) end marked on its label. Figure 3 shows the location of the + (positive) end of this capacitor.

After you've loaded and soldered these four parts, mount and solder the rest of them, including the 9V-battery snap connector. The orientation of the red-and-black lead is shown on the assembly drawing (fig. 3). Check your work carefully to ensure that you've placed all the parts correctly and that you haven't created a solder bridge between any of the adjacent pins.

Drilling and Labeling the Control Panel

Using the hole pattern shown in figure 4, locate and drill the holes in the aluminum panel that came with the Radio Shack proj-

(Continued on page 108)



ASSEMBLY
FIGURE 3

PIT STOP RADIO

ect box. It isn't necessary to decorate the front panel, but it does improve its appearance. You can make a decal by using an Avery 5x3-inch sticky-back label and Radio Shack's Project Label.

For best results, the sequence is:

1. Drill the panel as shown in figure 4.
2. Wash the panel.
3. Place the Avery label on the panel.
4. Trim the label's border and, using the aluminum panel as a pattern, cut the holes in it with an X-Acto knife.
5. Apply lettering, using Radio Shack's Project Labels.
6. Cover the decal with transparent mending tape to protect it from greasy fingers.

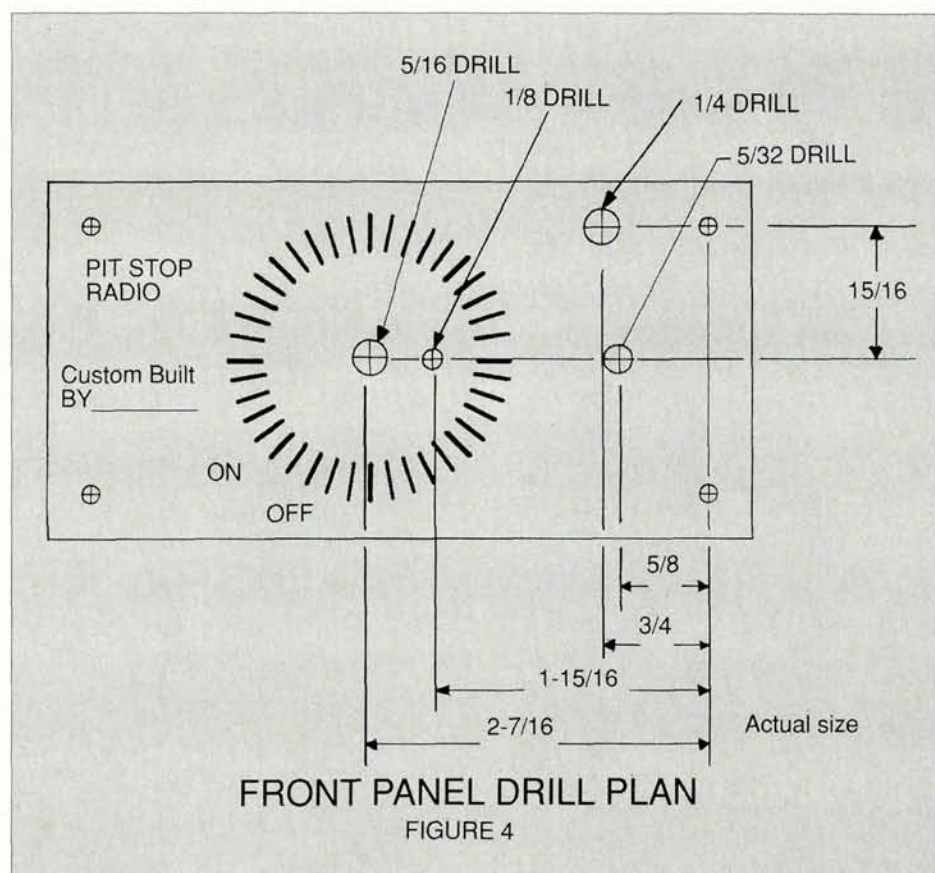
Next, mount the front panel parts. Place the on/off switch on the back of the 100K-ohm pot. Cut the shaft of the 100K-ohm pot to $\frac{1}{2}$ inch in length, then bolt the pot switch assembly into the panel. The knob can now be installed on the shaft of the pot. Mount the LED, using the LED mounting clip. Mount the connector-cable assembly in its hole, using the no. 0 grommet. An alternative source for a connector cable is a servo-extender cable (sometimes called an aileron-extender cable) that matches your radio system. Cut off the unwanted connector.

Final Assembly

Look at the picture of the finished PCB mounted on the back of the finished front panel. The PCB is supported by the two lugs on the on/off switch. Bend the lugs over and solder them to the etch that surrounds the two large holes. Feed the short lead of the LED through the hole marked "short," and feed the long lead of the LED through the hole marked "long." (See fig. 2.) Solder these two leads. Using two short pieces of bus wire, connect pot lead no. 1 and pot lead no. 2 to the corresponding holes in the PCB.

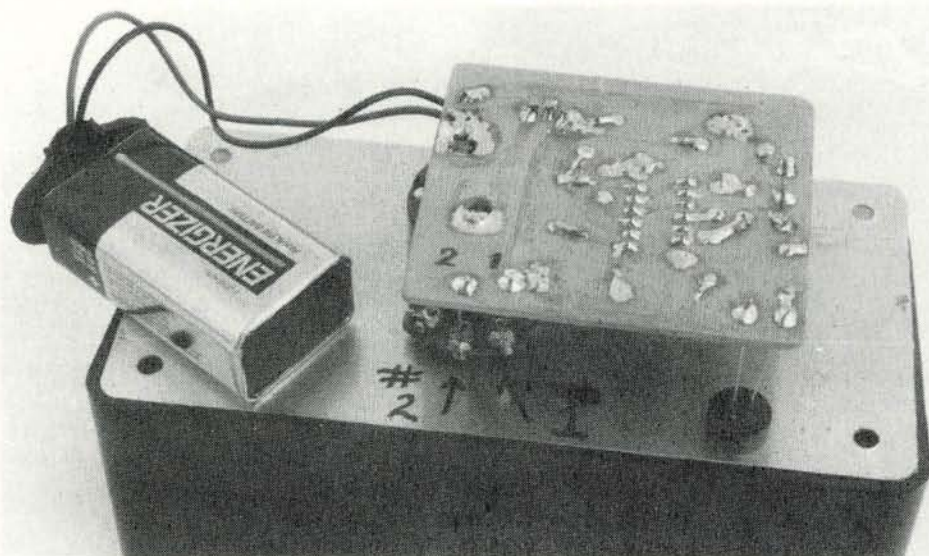
The last step is the connection of the output connector-cable assembly to the PCB. The three pads on the board are labeled - (negative), + (positive) and "signal." Figure 3 shows the pin arrangement for the Futaba* J and G connector. If you use another type of connector, make sure that you connect the ground lead to - (negative), the +5V lead to + (positive), and the signal lead to "signal."

Wrap the 9V battery in the 6x6-inch piece of $\frac{1}{4}$ -inch foam rubber and install the radio in its box. You should now have



FRONT PANEL DRILL PLAN

FIGURE 4



The finished PCB is mounted on the rear of the front panel. A 9V battery is used for power.

a working Pit Stop Radio. Turn it on and see if the LED lights; if it doesn't, check for 6 volts on the + (positive) end of the 22-MFD capacitor and make sure the LED isn't in backwards. Plug in a steering servo and check to see if you can control it by turning the knob. If there's no response, check all the connections, parts values and parts polarity. If everything is in the right place, the Pit Stop Radio will work.

Warning: Be careful when running high-powered motors with the Pit Stop

Radio. The motor may start to run as soon as you turn on the power switch. Make sure that *nothing* is in the way.

How to Operate The Pit Stop Radio

The Pit Stop Radio has a connector that should match the connectors on your R/C receiver. The signal coming from this connector is the same as the signal coming from your receiver when you operate your transmitter. Simply unplug the servo or speed controller that you want to test and plug it into the Pit Stop Radio's con-

PARTS LIST

Pit Stop Radio

Radio Shack Parts

Quantity	Part No.	Description	Price
1	270-233	Project box	\$2.19
1	271-092	100K-ohm pot	\$1.09
1	271-1740	SPST pot switch	\$0.69
1	272-402	Control knob	\$1.19/2
1	270-325	9V snap connector	\$1.19/5
1	276-1576	PC board kit	\$9.95
1	276-1577	Direct-etch transfers	\$2.99
1	270-201	Project labels	\$2.99

Pick one of these Ace R/C connectors to match your receiver connector.

Quantity	Part No.	Description	Price
1	19K83	Futaba JRx cable	\$3
1	19K42	Futaba GRx cable	\$3.50
1	50L705	No. 0 grommets	\$1.49/20
1	37K62	Foam rubber 1/4x6x6 inches	\$1

Digi-Key Parts

1	P374	T-1 3/4 red LED	\$1.56/10
1	NSC004	LED mounting clip	\$0.60/10
1	1N4001	1-amp 50V diode	\$0.75/10
1	KS556N	556 dual-timer IC	\$0.54
1	MC7806CT	6 V, 1-amp regulator	\$0.58
1	100Q	100-ohm 1/4 W 5 %	\$0.25/5
1	330Q	330-ohm 1/4 W 5 %	\$0.25/5
1	91KQ	91K-ohm 1/4 W 5 %	\$0.25/5
1	62KQ	62K-ohm 1/4 W 5 %	\$0.25/5
1	P5013	22 MFD 10V capacitor	\$0.21
1	P4533	47 MFD 50V capacitor	\$0.17
3	P4513	.01 MFD 50V capacitor	\$0.14(\$0.42)

Rist RaCing

As an alternative to the "etch-your-own" PC board from Radio Shack, Rist RaCing has a ready-made PCB (no. PSR-B) and front panel decal for \$5.

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sector. Turn on the radio, and control the servo or speed controller by turning the knob located on its face.

Calibration

To obtain maximum benefits from your Pit Stop Radio, calibrate it to match your transmitter. On the radio dial, put a mark that matches a given setup on your transmitter. Now you can replace a servo or speed controller and know that it will match the transmitter settings.

To calibrate the radio, first make sure that your steering servo and speed controller are operating normally with your transmitter. Set the steering trim so that the car runs straight, and mark the position of the steering servo's output arm that corresponds to this trim setting.

Adjust the neutral trim pot and the full-speed trim pot on your electronic speed controller for normal operation. Turn off your transmitter and plug your steering servo into the radio. Turn the knob on the radio until the steering servo's output arm has returned to the position that you've established as "running straight." With a fine-tip marker, mark this point on the dial. Plug in the speed controller and make two or three marks on the dial: one for neutral (determined by when the mo-

tor just stops running); one for full on (as indicated by the full-on LED on the speed controller); and if you have a reversing speed controller, mark reverse. Using these marks, you can now check your servos or speed controllers for proper operation without the use of your transmitter.

The resistors, capacitors, IC, voltage regulator and diodes can be obtained from Digi-Key Corporation*, which has a great catalog of electronic supplies. The output connector and cable can be ordered from Ace RC*. Another source for the output cable is your local hobby store. The Radio Shack items can obviously be bought at your local Radio Shack store. A finished PCB (etched and drilled) and a printed front-panel decal can be ordered by sending \$5 to Rist RaCing.

Now why didn't you think of that!

*Here are the addresses of the companies mentioned in this article:

Rist RaCing, 3712 Pecan Grove Dr., Huntsville, AL 35810.

Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.

Digi-Key Corp., 701 Brooks South, P.O. Box 677, Thief River Falls, MN 56701.

Ace RC, 116 W. 19th St., P.O. Box 511, Higgsville, MO 64037. ■

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RAMPAGE

(Continued from page 101)

you're doing when you adjust them.

If you don't have the fabled wealth of Midas to spend on new shocks after you've bought the Rampage, you can still give the suspension some backbone. Use

the stock dampeners, but add a pair of Blackfoot springs to the rear and put a ballpoint-pen spring on the dampener shaft to beef-up the front a little.

No matter which way you go, you'll have to work on the suspension if you're interested in straight power takeoffs. Camber adjustments help to fine-tune a car's handling, so I'll soon trash the

molded rods in favor of more turnbuckles and rod ends.

Finally, I'll put a wing on the rear. The chassis already has a provision for a wing tower, and the part is listed in the assembly manual as an option for the car. (Although they look similar, the Optima Mid wing tower won't fit without a little "field

(Continued on page 112)

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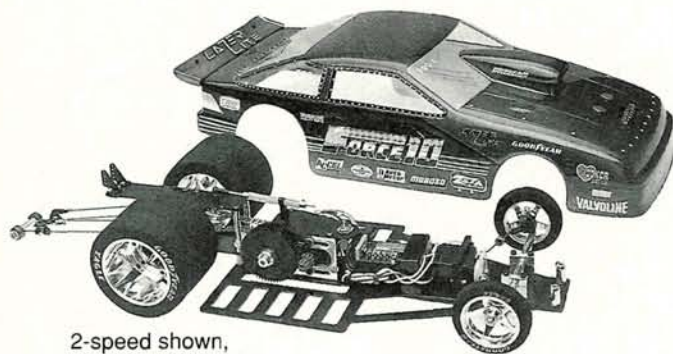
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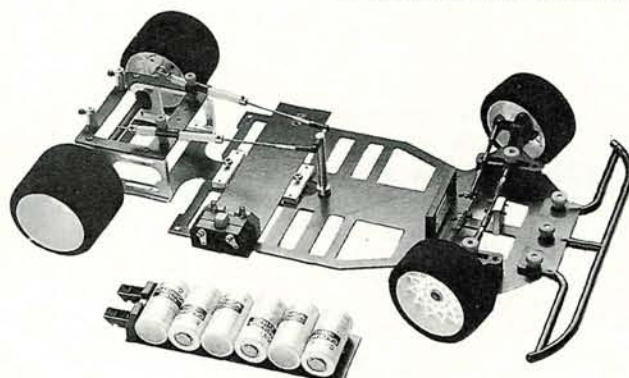
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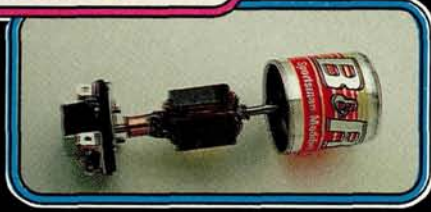
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RAMPAGE

(Continued from page 110)

modification.")

I can't wait to go on my next 1/10-scale Rampage!

*Here are the addresses of the companies mentioned in this article:

Kyosho/Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.

O.S./Great Planes Model Distributors.

KO Propo; distributed by Global Hobbies, 10725 Ellis Ave., Fountain Valley, CA 92728.

Du-Bro Products, 480 Bonner Rd., Wauconda, IL 60084. ■

HONDA RC30

(Continued from page 51)

to drive. The cycle tracks straight as an arrow, and, thanks to the unique shifting-ballast system, it's incredibly stable at low speeds. The radio system worked without a glitch, and the electronic speed controller is amazingly smooth and proportional. The brakes are very effective: even heading down a hill, I was able to bring the cycle to a controlled stop.

The RC30's lack of speed was disappointing, but I plan to remedy that, and I'll write a follow-up article. I'll soon have the RC30's hop-up goodies from Royal; these include a faster motor, ball bearings and different gears, all of which, I'm told, will increase speed by 65 percent! I may also modify the cycle's chassis to fit a 540 motor. (Who cares about run time, anyway?) I'll try to improve the front suspension to take out the wobble, although it didn't seem to affect the cycle's overall stability. I also plan to experiment with my own steering stabilizer arms and oil dampening.

The sharp-looking, ready-to-run cycle is a blast, and it has a lot of potential. Check it out!

*Here are the addresses of the companies mentioned in this article:

Royal Products, 790 West Tennessee Ave., Denver, CO 80223.

Bud's Racing Products, 52435 Route 113, Wakeman, OH 44889. ■

SCOPING OUT

(Continued from page 67)

My final lab test is the "dead-short test." I want to see if the speed controller is sturdy enough to survive the abuse it receives when a motor shorts or gears get jammed. I placed a dead short across the output of the Traxxas XL-1 for 10 to 15 seconds, waited about 10 seconds and

(Continued on page 131)

SCOPING OUT

(Continued from page 112)

tried it again. The Traxxas XL-1 was still pumping juice after three tries, but it was too hot to touch. If you force the Traxxas XL-1 to handle a dead short indefinitely, it will probably burn out, but it's tough enough to give you ample time to realize that you have a serious problem and unplug the battery pack. It pays to stop and fix a high-powered car when it stops running, before you melt the whole car.

The enjoyable part of testing a speed controller comes last—installing it in a car for a trial run! The Traxxas XL-1 is large, but it should fit into most 1/10-scale cars. With its fully proportional reverse and massive heat sinks, the Traxxas XL-1 would also be at home in a single-motor monster truck running a wheelie-popping 7-cell pack. The only vehicle that I had in running shape was my Turbo Ultima, which is equipped with a Checkpoint 15-turn motor and a 7-cell 1700mAh battery.

The instructions are practically nonexistent—one page with no pictures! If you're a first-time user of an electronic speed controller, it would be nice to have a drawing that shows how to hook up the

(Continued on page 140)

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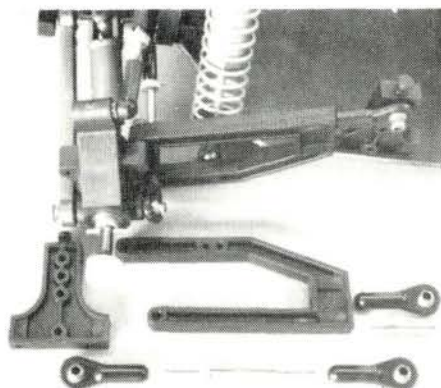
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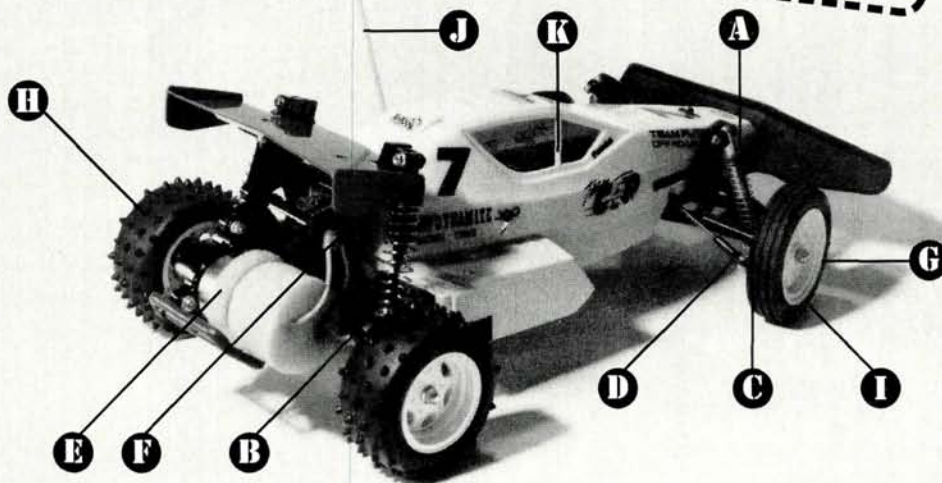
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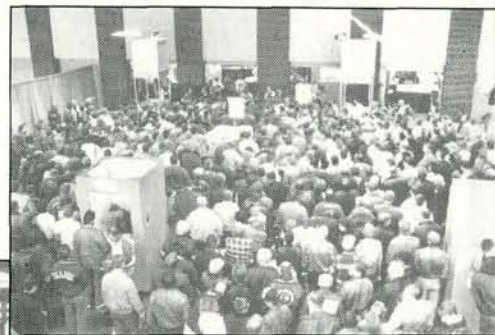


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Chicago Model Hobby Show

by WALLY DAVID



Top: Throngs of eager consumers gathered at the entrance to the convention center each morning for the 10 o'clock opening. When the doors opened, the aisles were flooded with people.

Above: The off-road dirt track attracted a lot of attention, as manufacturers demonstrated their latest cars and trucks.

AT LAST YEAR'S Chicago Model Hobby Show (November '89), the emphasis was on education. Sponsored by the R/C Hobby Trade Association (RCHTA), the first day-and-a-half was dedicated to manufacturers, distributors and dealers, but the *real* focus was on the two-and-a-half days when consumers had access to the show. There was a feeling that manufacturers



The large boat pond gave exhibitors plenty of space to demonstrate the latest in electric boat technology. The boat action seem to attract the interest of many R/C car enthusiasts. Having some top-name car racers compete in boat races didn't hurt, either!

needed to educate consumers, not conduct a "show-and-tell." The educational theme was underscored by numerous free seminars, which were open to the public and presented by industry experts.

Manufacturers had ample opportunity to display their new products, many of which debuted at the show! Consumers also learned about entire product lines and were given advance information on future items. This was the perfect opportunity to rub elbows and get the latest scoop!

A huge, retail hobby shop, run as a cooperative effort by local stores, sold many products seen in the display booths. The shop enabled modelers to buy items that piqued their curiosity, and it also freed manufacturers to talk with consumers.

The aisles were wider than in the past, and the display booths larger, making it easier to move

about the convention center and see the exhibits. The padded carpeting was truly appreciated by the many tired feet!

RCHTA worked hard to keep the interest of established modelers, and to attract new hobbyists, whom they hoped would become "hooked" and patronize local hobby shops. A flat, carpet racetrack was built to allow demonstrations of the latest R/C cars, trucks and motorcycles. To entertain spectators and further interest prospective modelers, celebrity races were scheduled throughout the show.

A dirt track with jumps was set up so off-road cars and trucks could "show their stuff." A large pond caught the attention of many R/C car enthusiasts, as some well-known car racers tried their hand at boat racing!

Expansion was a keynote of the show; there were more exhibitors and people in attendance than



"How To" seminars were held throughout the weekend and were free to the public. Seminars on a variety of topics were held by some of the industry leaders.



Those who attended the seminars listened intently. One of the prime objectives of the show was to attract "new blood" to the hobby. These seminars let consumers know that manufacturers care about them.



Team Losi's Jack Johnson (right), the ROAR 2WD Off-Road National Champion, was on hand to answer consumers' questions about the entire Losi line. The new JR-XT racing truck caused quite a stir; many people couldn't wait to get their hands on it.

ever, and there's every reason to expect this trend to continue! It was very encouraging to see the crowd of people who attended, the interest in new and existing products, and the rapport between manufacturers and consumers. The R/C hobby shows no signs of slowing down!

Look for this spring's return appearance of RCHTA in Pomona, CA (March 8 to 11), and—for the first time on the East Coast!—Philadelphia, PA (May 3 to 6). Perhaps I'll see you there! ■

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SCOPING OUT

(Continued from page 131)

maze of wires. Fortunately, I used the
 existing set of connectors, so installation
 wasn't too difficult.

Traxxas did provide a second sheet that
 describes the modifications necessary to
 install the XL-1 in the Cat, which is a car
 sold by Traxxas. It seems that the Cat's

servo radio compartment is completely
 enclosed. Any car of this type needs large
 holes cut in it to provide cool air for the
 electronic speed controller.

Keep in mind that the car must run for-
 ward when the LED lamp is burning
 green. If not, you must flip the reversing
 switch on your transmitter. If you reverse
 the motor leads to correct the problem,
 you'll get very poor performance because

a reversing speed controller is designed
 to go more slowly in reverse than it does
 in forward.

I used double-sided tape to mount the
 speed controller and the on/off switch.
 The on/off switch is cleverly mounted in
 a small plastic housing, which allows it
 to be taped to any smooth surface. You
 can also remove it from its case and mount

(Continued on page 144)

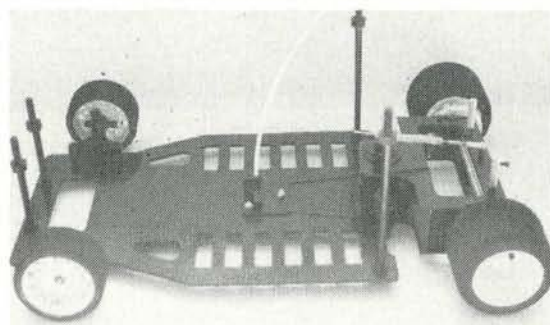
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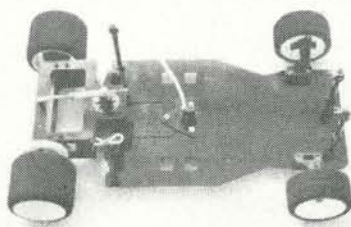
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4 #4-40 x 3/8 Steering Servo Screws	
2 #4-40 x 3/8 Rear Swaybar Screws	
4 #4-40 Upper Shock Nuts	\$ 2.95

SPECIAL!

Houge

Ball Bearing RC 10 Steering Bellcranks	\$ 26.95
--	----------

All JRX-2 Parts in Stock!

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JRX-2 Rims Front or Rear	\$ 5.95
RC 10 Rims Front or Rear	\$ 5.95

ProTrack

JRX-2 Wide Bumper	\$ 5.95
RC 10 Wide Bumper	\$ 5.95
Swept Back Nerf Bars	\$ 14.00

Robinson

Syntech Shock Fluid	\$ 3.00
48 Pitch Pinions	\$ 2.95

All RC 10 Parts in Stock!

Trackmaster

RC 10 Long Diff Shaft	\$ 12.95
-----------------------	----------

THE PARTS STORE.

machines are capable of competitive race speeds and should be operated with care.

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SCOPING OUT

(Continued from page 140)

it in the normal oblong switch-mounting hole provided in most chassis.

I adjusted the speed controller to match my Futaba* Magnum Sport transmitter. I always try to play dumb and follow the instructions exactly to see if they work. The first problem I ran into was that my car ran backwards when I advanced the throttle forward. A quick check of the motor leads verified that they were the correct polarity. The LED on the Traxxas XL-1 was burning red but the instruction sheet didn't tell me that red is reverse and green is forward! Of course, I'd figured this out in my test lab, so I flipped the throttle-reversing switch on my transmitter, and the car ran forward.

I also had difficulty with the built-in LED. The full-on indication wasn't precise. I followed the instruction sheet's recommendation that, when adjusting full-on, you watch for the setting that gives the brightest LED and the fastest motor output. I achieved the best results when the proportional control was fully set at its counterclockwise setting. A quick check with my oscilloscope revealed that, although the set-up procedure isn't precise, it works.

I installed a set of street tires on my Ultima, charged up two 6-cell packs and one 7-cell pack and headed out to the street (a dead-end with no traffic). As always, several neighborhood children showed up to help me drive the car.

The speed controller had a very smooth response. Acceleration was impressive. Reverse was proportional and very smooth. Reverse added realism and much pleasure when my helpers got the car stuck under a bush or parked car. The brakes worked well, making a 180-degree spin-out-and-go maneuver a snap. All in all, the Traxxas XL-1 is a very good driving speed controller.

I installed the 7-cell pack and took over the driving duties. The car was really fast with the combination of a modified motor and 7-cell pack! I put the car through its paces until the battery dumped. I immediately felt the heat sinks; they were warm, but not hot as expected. My car setup is fast and provides lots of cooling air to the speed controller. Keep this in mind and you should have no problem with excessive heat.

I liked this speed controller's large heat sink and smooth handling best. On the down side, the instruction sheet lacked a

(Continued on page 146)

ATTN. CLOD BUSTER AND OTHER TRUCK OWNERS NEW! CUSTOM ACCESSORIES FOR YOUR TRUCKS

CUSTOM ALUMINUM AND BRASS ACCESSORIES for your trucks direct from the manufacturer.

All parts come highly polished for a show chrome or show brass look, just specify ALUMINUM or BRASS on the order form.

Steel gears for the Clodbuster are now available. THOUSANDS OF PARTS IN STOCK.

Here are just a few of our items that we offer:

Single Roll Bar	Clod Front Bumper "square or round"
Double Roll Bar	Clod Rear Bumper "square or round" w/Ball Hitch
Working Roll Bar Light Kit	Lunch Box Rear Bumper w/Ball Hitch
Diamond Plate Bed Covers	Bruiser Front and Rear Bumpers w/Ball Hitch
Side Body Guards "single"	2 pc. Fuel Injection Stacks
Side Body Guards "double Knurled"	1 pc. 30 deg. Fuel Injection Stacks
Skid Bars "square"	Truck Puller Organ Stacks
Skid Bars "round"	Clod Buster Frame Reinforcer Kit
Bumper Guides	Clod Front End Operational Tilt Kit
Aluminum Rims	Dual Wheel Adapter Kit
Clod Warrior Front and Rear Bumper w/Ball Hitch	Trailers, Diamond Step Plates and A LOT MORE...

ALSO A FULL LINE OF R/C COMPETITION BOAT ACCESSORIES

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A full range of coordinated Monster Truck Wheels



Bru-Line "Super System" wheels allow most 1/10 and 1/12 scale cars and trucks the use of smaller truck tires all the way to the ultimate Clod Bluster tires.



Truck shown above with dual adapters and wheel covers. This modification can be used on many other cars and trucks.

Kyosho Double Dare with "Super System" wheels and Clod Buster tires. Just one of the many cars and trucks that can use this conversion.

Send \$2.00 For Catalog & Tech Sheet

Bru-Line Industries • P.O. Box 3786 • Center Line, MI 48015

DOUBLE DARE

(Continued from page 146)

ment capabilities, and they haven't leaked a drop of oil yet!

When I'd souped-up the trannies and shocks, I felt obligated to get the maximum power generators, so I chose the Trinity* Speedworks Monster Mash and Monster Mash 2 (for reverse) 16-turn,

single-wind motors. Trinity did its homework with these mills! Not only do they provide gut-wrenching power, but they also peak out at 40,000rpm. Installation was easy because I used the original motors, and Trinity provides the necessary capacitors and a well-detailed maintenance guide.

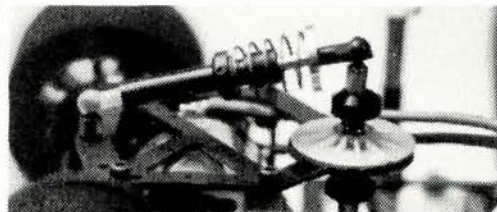
With all this horsepower, I needed a state-of-the-art speed controller, so I chose

the compact Tekin* ESC 600 PXT. This Tekin masters the design of Mosfet ingenuity coupled with Tempfet protection circuitry. The Tempfet circuitry protects the speed controller against overheating by simply shutting down, so it eliminates the usual speed-controller-burnout syndrome. As well as including heat sinks, capacitors and an adjustment wrench.

(Continued on page 150)

GET WIRED

WITH STORMER RACING PRODUCTS



10L / 12L Aluminum Motor Mount Plate.
Motor mount plate contains a motor lock screw to keep your motor from moving forward and losing your gear mesh and race, also makes it easier to set gear mesh.
#4010.....\$29.95

MAX-AMP 40 Power Supply:
Has triple simultaneous out-puts of: 1) 13.5v up to 20 AMPS for charging 2) 13.5 v up to 20 AMPS for charging 3) 4/6v up to 50 AMPS for Dynos.
Max-AMP 40 will charge 4 packs of batteries at a rate of 10 AMPS each while spiking to 50 AMPS on the 5v side operating a Dyno. Dimensions are 13" long 5" wide by 2-3/4" tall. The weight is a remarkable 4 1/2 lbs. (Pyramids 35 AMP unit weighs 25 lbs.) Max-AMP 40 is absolutely state of the art weighing 1/5th as much as the competition and offering three times the facilities with the advantage of far less bulk.
#179.00

Stormers "Hurricane" Fans.
Don't take chances with your expensive batteries and battery charging equipment keep a fan on them at all times to get rid of that unwanted and destructive heat buildup. Super quiet high volume full ball bearings with chrome grill 125VAC. #5001.....\$29.95

Light Weight Suspension Dampers.
Gives your car more traction and driveability than ride height adjusters or conventional shock absorbers, helps to eliminate chatter. Kits contain all damper components and necessary mounting hardware for each application.
#4050 10L.....\$18.95
#4051 12L.....\$18.95
#4052 TRC Pro 10.....\$18.95
#4053 Bolink E10.....\$36.95
#4054 Delta Villin.....TBA
#4055 Delta P12 Spider.....TBA
#Agitator 12.....\$18.95

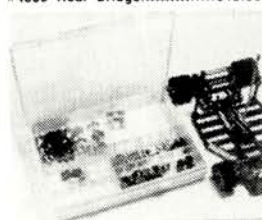


RFI Eliminator: (Motor capacitor system) The RFI Eliminator is a computer tuned and balanced system designed exclusively for R/C car and airplane electric motors to eliminate "Motor Noise" glitch.
#5002.....\$3.49

Traction Series T-Bars.

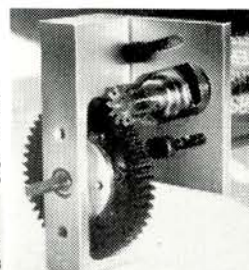
*Thicker T-Bars Are for High Bite Tracks.
*Thinner T-Bars are for low bite tracks.
#4011 10L T-Bar, .082.....\$6.95
#4012 10L T-Bar, .062.....\$5.95
#4013 10L T-Bar, .048.....\$4.95
#4014 12L T-Bar, .082.....\$4.95
#4015 12L T-Bar, .048.....\$3.95
#4016 PRO 10 T-Plate, .074.....\$9.95
#4017 PRO 10 T-Plate, .048.....\$8.95
#4018 E10 T-Plate, .074.....\$10.95
#4019 E10 T-Plate, .048.....\$10.00

Aluminum T-Bar Bridges:
Fits Delta Villin and McAllister Outlaw. Eliminates the stress cracking and tweaking that's common with the original equipment bridges, for a more consistent car.
#4008 Front Bridge.....\$19.95
#4009 Rear Bridge.....\$19.95



Adjustable compartment parts box. Locking hinged lid parts box has adjustable compartments so you can customize it to fit your personal needs. 7x10x1.5 inches. #5000.....\$13.95

2 to 1 Gear Reduction Transmission.
Designed to fit most 1/10 on road cars, ideal for tight indoor and outdoor tracks, truck and tractor pulling and electric boats.
#1900.....\$47.95
#1901 (less gears).....\$39.95



4 to 1 Gear Reduction System
Designed specifically for the Clodbuster to increase low end torque for truck pulling or extended run time, also fits the blackfoot and others, part is a direct bolt on to Clodbuster and Blackfoot Gear Boxes.
#2000.....\$57.95 #2001 less gears.....\$52.95

New from Twister: Pocket Commutator Lathe. At 4"x5"x3", it's the worlds smallest and it's accurate to .0002. Most Lathes can't do better than .0005. Uses a 4-Cell Battery pack for power. Lathe comes with a carbide cutter.....\$239.00
Optional Diamond Cutter.....\$80.00

CLodbuster OWNERS

FINALLY: All steel gear sets! Kit comes complete with all gears for front and rear.
#AP6.....\$99.95
All Aluminum replacement chassis. Not just a bottom or a front or rear, but a complete aluminum replacement Chassis with its own Chassis brace built right in. (probably one of the trickiest items we've ever seen for a Clod. Black, Silver, or Blue anodized.
#SC15.....\$99.95
#ES23: Aluminum tube front bumper.....\$24.95
#ES24: Twin tube rear bumper.....\$14.95
#2030: Trinity matched madness 16 T Clodmotors.....\$59.95

Gonzo Matched Sanyos

4 Cell SCE Cells.....\$26.75
6 Cell SCE Cell.....\$39.75
7 Cell SCE Cells.....\$46.25
4 Cell SCR Cells.....\$21.00
6 Cell SCR Cells.....\$31.50
7 Cell SCR Cells.....\$36.50

Race Packs

6 cell 1200 SCR, Wires, T/C.....\$27.95
6 Cell Race, Wired, T/C.....\$19.95
7 Cell Hump Pack, Wired, T/C.....\$29.95

Chargers

Tekin, BC100S.....\$76.95
BC870.....\$57.95 Reflex.....\$104.95
Novak, NEC-2.....\$57.95 Nec-3.....\$104.95

1/10 on Road Tires, TRC, Delta, W/BBS Wheels specify blues, greens or yellow.
Fronts.....\$8.95 Rears.....\$10.50

1/10 TRC T/M Radials

Specify silver, gold or red compound
Fronts (per tire).....\$12.75
Rears (per tire).....\$14.00
Ask about CKW and Mintech radials.

1/12 on Road Tires, TRC and Delta specify blues, greens or yellows
Fronts.....\$6.95 Rears.....\$6.95

ORDERING INFORMATION: We accept Visa and M/C. C.O.D. Adds \$3.00, shipping and handling \$4.95. (Except power supplies). UPS: Air Service, \$4.95 plus 10% of subtotal.

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 Diff. Spring\$3.00
 Double BB Adaptor\$6.95

UNIVERSAL HARDWARE
 Trans./Axle Shim Kit (1/4" & 3/16" shafts) RC-10.....\$3.95
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 1/8" and 3MM\$2.00
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 (for 5-40, 6-32, screws,
 1/8" and 3MM shafts) \$2.00
 Stand Off Spacers
 4-40, 3MM.....\$2.00
 Aluminum Swivel Stand Off
 Spacers (4-40, 3MM) ...\$2.00
 Susp. Hrdwr. Kit-R.C. 10..\$6.00

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 Pumpkin, Rockbuster,
 Roadrunner II and Lazer
 FX/10, Sonic Fighter,
 Striker & Grasshopper II.
 Bullet Proof Diff. Kit
 With Pin\$11.95
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 Add Exact Freight
 Prices Subject to Change

DOUBLE DARE

(Continued from page 148)

Tekin has incorporated large, 13-gauge wires and a BEC.

To provide maximum control, I installed the Futaba* Magnum 2PBKA Junior. This version of the already-popular industry standard radio has a new look and the newest high-tech electronics. The list of features seems endless, but most important are the R102JE receiver, the magazine-style battery loading cartridge and the BEC system. As soon as you grab the pistol grip, you'll notice a change: the transmitter is balanced better, and it sports a ring trigger that prevents any slippage and makes reverse control easier. Minor steering and throttle-trimmer adjustments are also easy to make.

The hardest decision was choosing the right body to complete the transformation. I decided to call on the master of R/C paint and body detailing, Eric "The Brush" Goldshcrafe, who took the stock body and whipped an outrageous, radical design blending pearl white with purple and a ribbon design flowing down the sides. Eric sprayed the stock chrome wheels with a couple of coats of candy purple,

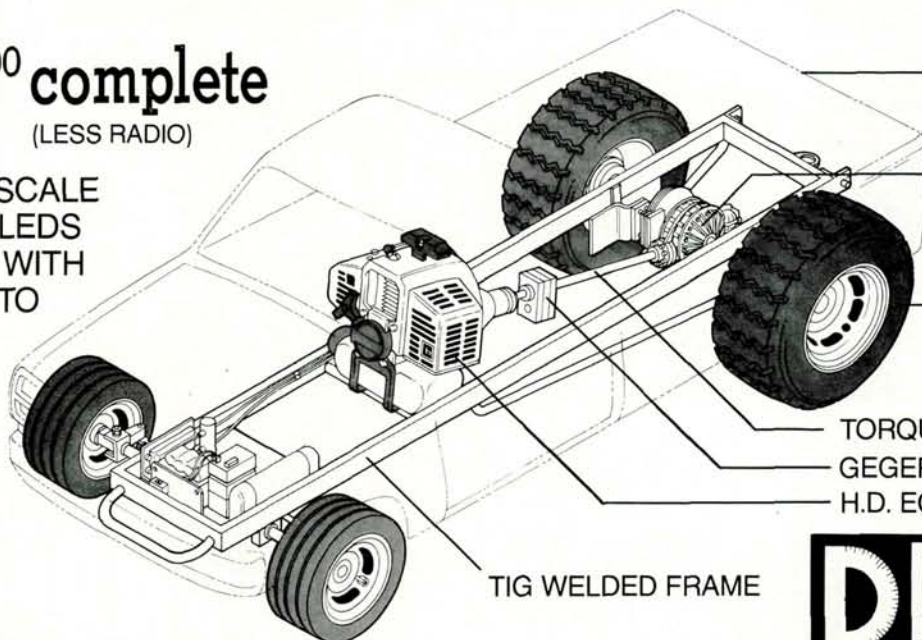
(Continued on page 160)

NEW!

MYTOY *Quarter Scale* PULLING TRUCK

\$1795.00 complete
 (LESS RADIO)

**QUARTER SCALE
 PULLING SLEDS
 AVAILABLE WITH
 CAPACITY TO
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1990 FORD P/U
 FIBERGLASS BODY

SKELLENGER
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 REAR END

10:75 x 4.00 x 5"
 REAR TIRES

TORQUE TUBE DRIVE SHAFT
 GEGERE GEARBOX
 H.D. ECHO 21cc ENGINE

TIG WELDED FRAME

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*Quarter Scale
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WHAT'S NEW

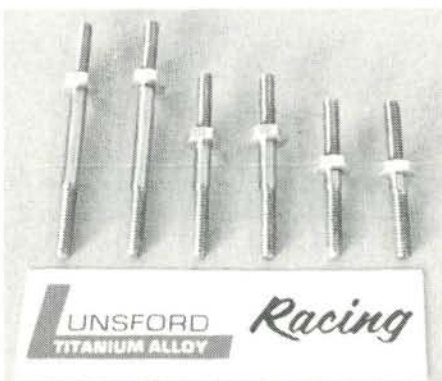


VRP Lubribearing

VRP Lubribearing (LB611) is a new ball-bearing grease that goes on in thin coats and seeps into the crevices between bearings and other moving parts. The carrier fluid evaporates to leave a thin layer of grease that reduces wear and tear. Since VRP Lubribearing is a grease, not an oil, it won't fly out while your car is running.

Price: \$4.50

For more information, contact Verona Racing Products, 4555 Groves Rd., #15, Columbus, OH 43232.



LUNSFORD RACING Titanium Turnbuckles

Lunsford Racing Titanium Turnbuckles are made from the lightest and strongest titanium—6AL 4V. The precision-cut left- and right-hand $\frac{1}{4}$ threads and $\frac{1}{4}$ -inch aluminum adjuster nut allow quick, precise caster/camber linkage adjustments.

Price: \$7 to \$20

For more information, contact Lunsford Racing, 619 First Ave. E., Albany, OR 97321.

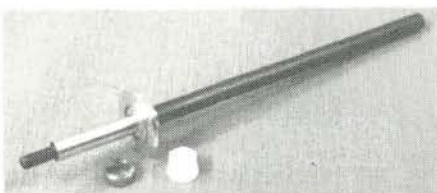


BOLINK Chrysler LeBaron

Bolink announces the latest in its full line of NASCAR-style bodies—the 1989 Chrysler LeBaron. Bolink will be the first to produce the LeBaron in $\frac{1}{10}$ -scale, but it has already had limited exposure on the ARCA circuit.

Price: \$18

For more information, contact Bolink R/C Cars, Inc., 420 Hosea Rd., Lawrenceville, GA 30245.



Graphite Axle

Bolink's new brass-sleeved graphite diff axle now joins the growing list of accessory parts for the Eliminator 10 and Eliminator Sport. The axle has a machined-brass sleeve for more precise operation, and it comes with a diff nut and a ball bearing for the spur gear.

Price: \$31.95

For more information, contact Bolink R/C Cars, Inc., 420 Hosea Rd., Lawrenceville, GA 30245.



'88 Stock-Car Bodies

Are you looking for an '88 stock-car body for your $\frac{1}{10}$ -scale car? Look no further: Bolink has them all!—including the '88 T-Bird, Buick Regal and Monte Carlo. With the popular Pontiac Grand Prix and the '89 Olds, Bolink

offers the industry's most complete line of stock-car bodies.

Price: \$18

For more information, contact Bolink R/C Cars, Inc., 420 Hosea Rd., Lawrenceville, GA 30245.



BULLET RACING Competition Kit

This is a first-class R/C car conversion kit made for serious racers. Bullet Racing's Competition Kit includes: graphite chassis; graphite shock towers; graphite trailing arms and mounting hardware; telescopic drive system; and motor heat sink. The kit fits the RC10, the Ultima and the new RCX2, which has the RC10 front and JR-X2 transmission hole in the rear.

Price: \$149.95

For more information, contact Bullet Racing Products, Inc., 14435 Tomball Pkwy., Houston, TX 77086.



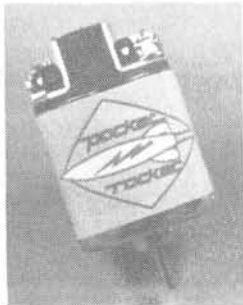
Telescoping Drive System

Bullet Racing's new Telescoping Drive System can be adapted to a stock RC10 transmission, or, using part no. 4002, it can be used on any straight-shaft transmission. It can also be used with modified motors.

Part no. 4015S

Price: \$56.95

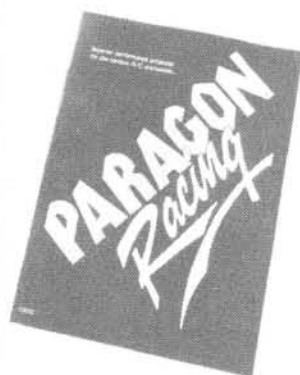
For more information, contact Bullet Racing Products, Inc., 14435 Tomball Pkwy., Houston, TX 77086.



TWISTER MOTORS Pocket Rockets

Twister's new Pocket Rockets are easy on your wallet, but hard on the competition. Their low cost and tremendous power and reliability will help you bridge the gap between stock and modified motors. If you're just starting to run an R/C car, the \$28 bushing-style Pocket Rocket is the first step up from the OEM stock motors. Whether you're just playing around or racing, you'll love the super performance and long run times of these Pocket Rockets. At just \$45, the new ball-bearing-style Pocket Rockets with adjustable timing let you enjoy the excitement of modified motors at about half the cost.

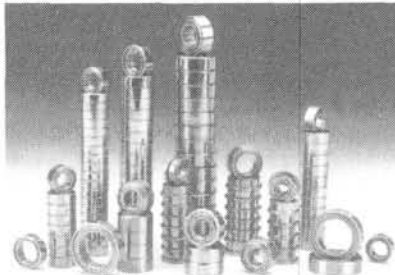
For more information, contact Twister Motors, 657 E. Arrow Hwy., Suite H, Glendora, CA 91740.



PARAGON RACING New Catalog

They're here! Paragon's products are shown and described in this colorful new catalog.

For a copy, send \$2 to Paragon Racing Products, Dept. CA2, 690 Industrial Circle So., Shakopee, MN 55379.



HORIZON Dynamite Bearings

The secret to obtaining high speeds with any car is clear: replace every nylon and Oilite bushing with a ball bearing. Not only will your car travel faster owing to its significantly lower rolling resistance, but you'll also avoid having to replace expensive ruined parts (the result of worn-out bushings). Unlike a ball bearing, which keeps everything centered, a bushing can wear unevenly, depending on the loads placed on it. Dynamite bearings are specifically designed for R/C cars, and tolerances and bearing hardness are perfect for this application. Stainless-steel and chrome bearings are available, and most sets (e.g., the Dynamite RC10 bearing set) use only the best NMB stainless-steel bearings.

For more information, contact Horizon Hobby Distributors, 3102 Clark Rd., P.O. Box 6029, Champaign, IL 61821.



RACER'S CHOICE Traction Formula

Racer's Choice R/C Products introduces TQ8+, which is its new, professional, tire-traction formula. The TQ8+ joins the company's line of high-quality lu-

bricants, motor and bearing cleaners, performance motor drops and its other traction formula—the TQ. Made with a fruit-oil base and containing *no* petroleum distillates, the pleasant-smelling TQ8+ offers lasting results and superb traction. It also reduces tire wear and glue separation.

Price: \$10.95

For more information, contact Racer's Choice R/C Products, Inc., P.O. Box 405, Medinah, IL 60157.



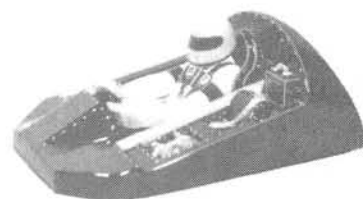
McALLISTER RACING Stinger

The Stinger is McAllister Racing's new off-road single-seater body for the JRX-2, and it fits the RC10, too. It's very aerodynamic with 3D side panels, and it comes with a separate wing.

Product no. B131

Price: \$19

For more information, contact McAllister Racing Inc., 2245 First St., Unit 105, Simi Valley, CA 93065.



World-Class Driver

McAllister Racing has produced a new driver and interior for the world-class, factory GTP cars of IMSA and Group C. Lots of detail and a separate driver's helmet make it easy for perfectionist R/C racers to achieve superb results.

Part no. A-424

Price: \$12

For more information, contact McAllister Racing, 2245 First St., Unit 105, Simi Valley, CA 93065.

(Continued on page 154)

WHAT'S NEW



TEKIN ELECTRONICS BC100S Battery Charger

From Tekin Electronics (makers of World Championship-winning electronic speed controllers) comes the new BC100S Soft-Pulse Peak-Detection Battery Charger. It's designed to take full advantage of both SCE and SCR batteries. For your delicate SCE race packs, it has new soft-pulse circuitry that gives low-voltage pulses to ensure more capacity and longer battery life. This can give you as much as a 20-percent longer run time.

For your SCR packs, it has a hard pulse to give all the power your racing demands. Calibrate the charger easily by using its dial—at a rate of anywhere from 1 to 9 amps.

Price: \$111

For more information, contact Tekin Electronics, 970 Negocio, San Clemente, CA 92672.



Motor Break-In Machine

The MOT 800 motor break-in device is an all-new, inexpensive, and blow-up-proof way to test your motors. Simply attach the MOT 800 to any power supply with a range of 7.2 to 16 volts (including a 7.2V or an 8.4V Ni-Cd battery pack, or a standard power supply), attach the motor, and check it on your own ammeter or voltmeter. You can also simply let it break-in while you keep track of its vital signs. The unit is de-

signed to be completely impervious to overheating and to reverse-voltage input. It can handle any motor that draws up to 5.5 amps (constant current), and can be easily adjusted to put out up to 10 volts. It comes in a strong, light-weight package.

Price: \$46

For more information, contact Tekin Electronics, 970 Negocio, San Clemente, CA 92672.



COVERITE Aerosol Paint

The Coverite Bodyshop is a new division of Coverite. First in its lineup are aerosol paints in 6-ounce cans. With more than 20 years experience in painting and detailing R/C airplanes, Coverite has developed an aerosol that's suitable for the small, cramped spaces inside Lexan car bodies. The cans have a special valve and nozzle system that works like a mini spray gun and allows the application of "mist" coats rather than "wet" coats. This is the method used by professionals when working with an airbrush. Coverite's Bodyshop colors: Whizzer White, Red Hot, Orange Orange, Varoom Maroon, Mid Ocean Blue, Vader Black, Mellow Yellow, Bruiser Blue (Metallic), Gold Rush (Metallic), Nevada Silver (Metallic), Smokey Gray (Metallic), Slightly Blue (Metallic).

Price: \$3.75

For more information, contact Coverite, 420 Babylon Rd., Horsham, PA 19044.



PARMA Scale Decals

Parma proudly offers two new decals for scale racing fans: Mr. Gasket and Mr. Goodwrench. The Goodwrench decal offers perfect ^{A1}/10-scale detail, and Mr. Gasket gives a great assortment of hard-to-find "extras." With over 70 styles to choose from, many Parma decals are available in 1/32, 1/24, 1/12, 1/10, 1/8 and 1/4 scale.

For more information, contact Parma International, Inc., 13927 Progress Pkwy., North Royalton, OH 44133.

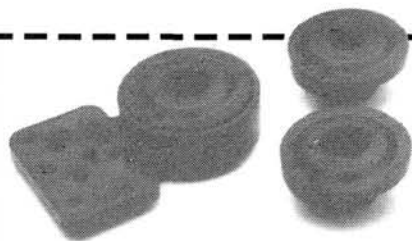


Cyclone II Motor Series

Parma's Cyclone II Motor Series includes machine- and hand-wound motors with bushings or bearings. The new, thicker can and the strongest motor magnets available combine to give drivers power they had previously only dreamed of having. With the Cyclone cooling system and thick heat sinks, this motor delivers unbelievable power throughout a race. Don't get left at the starting line!

Price: \$25 to \$65

For more information, contact Parma International, 13927 Progress Pkwy., N. Royalton, OH 44133.

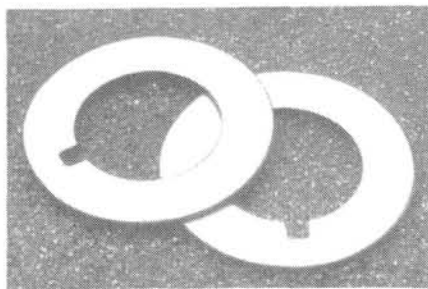


TRINITY Variable Servo-Saver

Trinity's servo-saver is designed with today's cars in mind. It has a number of linkage mounting holes that allow you to vary the amount of Ackerman in your front steering to suit track conditions. Made of high-density filled nylon for maximum strength and resistance to twisting and bending, the servo-saver comes with mounting centers for Futaba, Novak and Airtronics servos, so you'll be able to use it even if you decide to change your servo or radio system. The servo-savers are packaged under three different part numbers, and they're available assembled with the center that's marked on the package (the other two centers are in the bag). The included alignment tool makes changing the servo centers a breeze!

Price: \$3.59

For more information, contact Trinity, 1901 E. Linden Ave., #8, Linden, NJ 07036.



Notched Diff Rings

These diff rings give superior differential action owing to their tremendous surface hardness, extreme flatness (no distortion from notching) and lack of burrs. These features ensure the smoothest, most consistent differential action possible from any available diff ring—especially a notched diff ring.

Price: \$2.99/pair.

For more information, contact Trinity Products, 1901 E. Linden Ave., #8, Linden, NJ 07036.



Matched & Assembled SCE Packs

Trinity's new Magic Motorsports line of performance products includes these new matched, assembled, SCE battery packs. Each cell in every pack is matched by voltage and capacity to ensure maximum performance. Individual cells are covered in a clear shrink-wrap for protection and then assembled into packs with high-amp silver braid. The saddle packs are connected with 12-awg wire and are the only battery packs that truly use premium "matched" cells. They're available in 4-cell, 6-cell 1/12-scale, 6-cell 1/10-scale, 6-cell stick packs, and 7-cell 1/10-scale configurations.

Price: \$41.00 to 69.50.

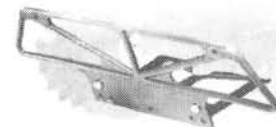
For more information, contact Trinity Products, 1901 E. Linden Ave., #8, Linden, NJ 07036.



THE CONTROL ROOM Hot Posters!

Commercial advertising photographer David A. Gautreau has released the first in a series of high-quality posters especially designed for R/C sports enthusiasts. The posters are 32 inches wide and are available through mail order.

For more information, contact The Control Room, 1334-D N. Benson Ave., Upland, CA 91786.



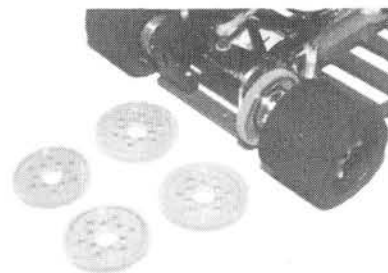
PARMA Universal Front Bumper

Parma International's new versatile bumper will fit all available 1/10-scale on-road and off-road R/C cars. When running a sedan body, you can use the two front holes for body posts, and this will stabilize the front of the car and eliminate body "chatter." For off-road competition, this nylon bumper will take a lot of punishment without failing.

Part no. 13221

Price: \$7

For more information, contact Parma International, 13927 Progress Pkwy., North Royalton, OH 44133.



G.P.M. RACING 64-Pitch Spur Gears

Now G.P.M. offers a line of 64-pitch spur gears that will provide ratios that aren't available with conventional gears. Now you can have 97-tooth, 99-tooth, 105-tooth and 107-tooth spur gears—all made of extremely durable, self-lubricating Nylatron.

Price: \$5

For more information, contact, Hobby Etc., 295 D.W. Highway., Nashua, NH 03060.

(Continued on page 156)

WHAT'S NEW

TEAM LOSI Hard Balls

Smooth differential action will last much longer and require less maintenance with the new Team Losi $\frac{3}{32}$ Hard Balls for the JR-X2. These ultra-high-quality grade-25 balls measure over "80 Rockwell" in hardness.

Part no. 4016, $\frac{3}{32}$ Hard Balls (fit the JR-X2); no. 4015, $\frac{1}{8}$ Hard Balls (fit the RC10 and most $\frac{1}{10}$ - and $\frac{1}{12}$ -scale cars)

Price: \$7/set of 10

For more information, contact Team Losi, Inc., 1655 E. Mission Blvd., Pomona, CA 91766.

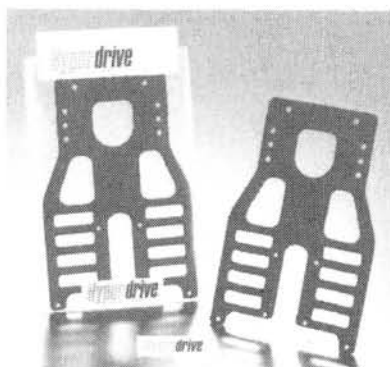


MTM Modified Motor

With the introduction of its new MTM motor, Team Losi/Revolution Racing Motors meets the needs of those who race modified monster trucks. This high-torque, hand-built, wet-magnet modified motor packs the power needed to move the largest monster-truck tires and spray the competition with dirt. Its unique construction means that it runs coolly, so reducing the likelihood of having to do an expensive rebuild.

Price: \$80

For more information, contact Team Losi Inc., 1655 E. Mission Blvd., Pomona, CA 91766.



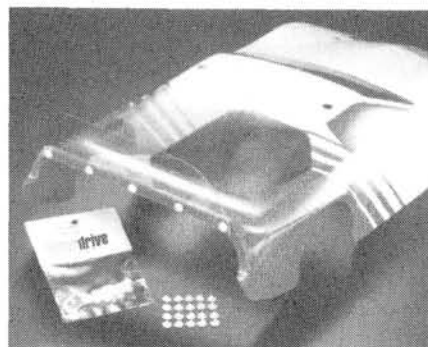
HYPERDRIVE RACING Saddle-Pack Chassis

For racers who prefer a saddle-pack chassis, Hyperdrive offers this graphite version, which fits the Hyper 10 Sportsman and the Hyper 10 Competition racing cars.

Part no. AC 0204

Price: \$85

For more information, contact Hyperdrive Racing Systems, Inc., 3210 Howard Nickell Rd., Fayetteville, AR 72703.



Nylon Pop Fasteners

Extremely light and strong, these little fasteners can be used to attach spoilers, air dams, etc., to bodies and wings. Lighter and cleaner than servo tape, they're also reusable.

Product no. AC 0103

Price: \$1.25/pack of 20

For more information, contact Hyperdrive Racing Systems, Inc., 3210 Howard Nickell Rd., Fayetteville, AR 72703.



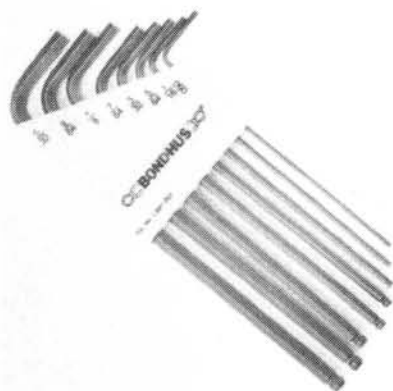
RC10 Extended Motor-Plate Kit

This new Motor-Plate Kit consists of a motor plate, a modified transmission case, a rear-motor dust cover and a mid-motor dust cover, and assorted belts (nos. 78 and 81). The kit will allow a wider variety of ratios when using the Hyperdrive belt system.

Product no. HY 1007

Price: \$39.95

For more information, contact Hyperdrive Racing Systems, Inc., 3210 Howard Nickell Rd., Fayetteville, AR 72703.



BONDHUS Hex Key Set

The BLX 8 hex-key set contains eight hex keys: .050, $\frac{1}{16}$, $\frac{5}{64}$, $\frac{3}{32}$, $\frac{7}{64}$, $\frac{1}{8}$, $\frac{9}{64}$ and $\frac{5}{32}$ —all packaged in the handy, patented, Bondhex® case, which carries identification of the tool sizes and locks them into place for storage and easy access.

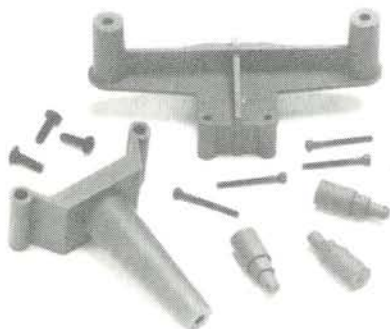
Part no. 10932

Price: \$6.05

For more information, contact Bondhus Corp., 1400 East Broadway, P.O. Box 660, Monticello, MN 55362.

(Continued on page 158)

WHAT'S NEW



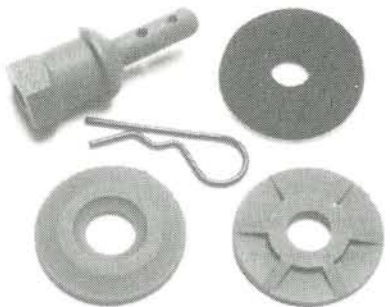
CRP Body Mounts

These body mounts allow you to mount a truck body to your RC10—a monster-truck conversion. The package includes a set of front and rear mounts.

Part no. 1561

Price: \$9.99

For more information, contact Custom Racing Products, 3250 El Camino Real #B3, Atascadero, CA 93422.



Swivel Body Posts

CRP's swivel body posts significantly reduce the possibility of damaging your Lexan or polycarbonate car body. They use a large disc on both the top and the underneath of the body, and each disc is cushioned with a foam pad. When a car body is twisted in a crash, the foam-padded discs pivot on the body posts and prevent the cuts or creases that occur when a car has rigid mounts.

Part no. 2530

Price: \$5.50/pair

For more information, contact Custom Racing Products, 3250 El Camino Real #B3, Atascadero, CA 93422.



Rear-Wheel Adapter

Put monster-truck tires and wheels on your RC10 by using these wheel adapters. Use with no. 1559 front stub axles.

Part no. 1560

Price: \$7.99

For more information, contact Custom Racing Products, 3250 El Camino Real #B3, Atascadero, CA 93422.



EASY-WELD Torch/Soldering Iron

The all-metal Easy-Weld Micro-Flame Torch comes complete with torch tips and soldering-iron tips. It has a 2,400-degree Micro-Flame Tip that has precise flame control and is great for heating, soldering and brazing. It will burn for 60 minutes on one butane fill-up. This is a great addition to your workbench and field box. (Butane isn't included.)

Price: \$34.95

For more information, contact Du-Bro Products, 480 Bonner Rd., P.O. Box 815, Wauconda, IL 60084.



Super-Glue Applicator

The Devcon Super-Glue (CA) Push-Button Applicator is perfect for making quick, easy field repairs. Everyone

seems to love this new product.

Price: \$3.03

For more information, contact Du-Bro Products, 480 Bonner Rd., P.O. Box 815, Wauconda, IL 60084.



RACO Spec Racer

PBS Engineering and RACO Model Craft have collaborated to develop a new class of 1/4-scale racing car. The most successful and popular full-scale racing class is the Spec Racer class. The 1/4-scale SCCA Spec Racer is based on the race-proven RACO 1/4-scale Grand National chassis that's used for oval-track racing. This chassis has been modified and updated to make it suitable for the Spec Racer road-racing car. The Spec Racer model is 39.5 inches long, 19 inches wide, and weighs about 35 pounds. It's powered by a 23cc Zenoah fan-cooled, 2-cycle gas engine with an automatic clutch. An inboard rear disc brake slows the car. The model is available fully assembled and fitted with a fiberglass body. It's ready for 2-channel radio installation, paint and scale detailing.

Price: \$1,495

For more information, contact RACO Model Craft, Inc., 1400 E. St. Andrews Pl., Santa Ana, CA 92705.

Descriptions of new products appearing on these pages were derived from press releases supplied by the manufacturers and/or their advertising agencies. The information given here does not constitute endorsement by Radio Control Car Action, nor guarantee product performance or safety. When writing to the manufacturer about any product described here, be sure to mention that you read about it in Radio Control Car Action.

DOUBLE DARE

(Continued from page 150)

giving the wheels an anodized appearance. I topped off the rims with a set of DuraTrax* monster-truck, diamond-spike

rubber tires. These new spikes are wider than the originals, so they provide a wider stance. Radical!

Performance

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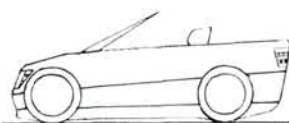
CALL 919-471-2060 8:00am to 8:00pm E.S.T.

6-cell Sanyo KR-1300 SC Sport Pack. For those of us who don't compete in races where only 1200 and 1700mAh cells are legal, this pack is an inexpensive alternative with a run time that's slightly longer than that of the 1200s.

After a quick charge, I was off to the testing grounds. Having had experience (bad experience) with the results of doing inadequate radio checks before running my R/C models, I've developed a simple list of final checks that should be made before ignition, and I pay special attention to possible radio interference. Initial adjustments were a cinch with the Futaba radio. With a turn of a knob, all final steering and throttle adjustments were completed.

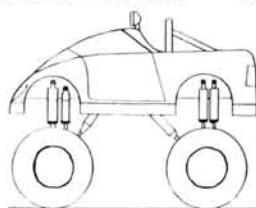
My designated test date was completely rained out, so I took the truck to a vacant gymnasium. After a few slow laps around the gym, I decided to give the truck a true workout. I took the Double Dare to the beginning of a long straight and buried the trigger. The front wheels popped off the ground and a loud, screeching noise emanated from the rear wheels as they began ripping at the laminated-hardwood floor. Midway down the straight, I decided to slow down and try a bit of slaloming, but the truck flipped onto its side. The 4WD/

(Continued on page 162)



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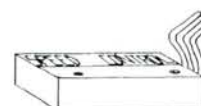
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KO Propo and JR Propo also available. Please call for info.



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DOUBLE DARE

(Continued from page 160)

4WS was just too sensitive for the wooden floors. At this point, I decided to hold off until the rain stopped.

If it had rained one more day, I would have considered building an ark, but the rain finally stopped. It was time for the remaining R/C elements—sand, dirt and grass. With an additional peak-charge to the Speedworks battery pack, it was launch time. As soon as the truck hit the sand, I applied full juice to the mighty Mash motors. The DuraTrax spikes began to toss sand in all directions and the truck sped off. Again, however, the truck rolled at the slightest attempt to turn.

I decided to test the Double Dare on dirt and grass, but I became frustrated with its constant rolling. Because of the truck's inherent tendency to roll, I recommend that the 4WS be eliminated. First, exchange the left rear steering block with the right rear block; then buy a rear linkage like the one used in the Big Brute. Eliminating the 4WS this way should enhance the truck's handling. Other cures for the Double Dare's instability are mounting super-wide Clod Buster tires, or drilling

(Continued on page 164)

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DOUBLE DARE

(Continued from page 162)

air holes in the backs of the rims to let the tires breathe. (The rims form an airtight seal with the tires, and this produces ex-

cessive bouncing on uneven terrain.)

At the end of my final test, the truck shut down without warning. After careful examination, it was evident that the Tempfet circuitry kicked in and shut down the speed controller. I was impressed with

this safeguard because it prevents irreversible damage. The circuitry will function again if you simply shut the speed controller off and then on again, but this isn't advisable, because the speed controller is usually very hot if it gets to the point of shut-down. Obviously, it isn't wise to mount this or any other speed controller underneath the chassis cover where there's no airflow. It was a good test to see if the Tempfet circuitry actually worked, but it's best to mount the speed controller on top of the chassis cover, where there's plenty of cooling air.

Conclusion

These modifications did quite a lot to enhance the Double Dare's performance, but steps must be taken to prevent its tendency to roll over. By switching from the 4WS to the 2WS setup used on the 2WD trucks, you might not cringe at the mention of the word "turn"!

*Here are the addresses of the companies mentioned in this article:

Kyosho/Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.

Thorp Mfg., 380 S. East End, Unit H, Pomona, CA 91766.

Imex Model Co., 53 Trade Zone Ct., Ronkonkoma, NY 11779.

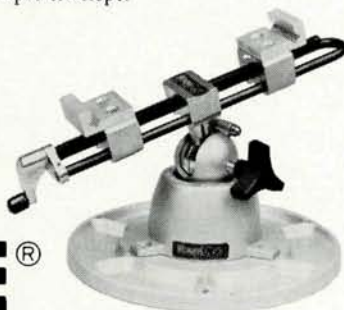
Trinity, 1901 E. Linden Ave., #8, Linden, NJ 07036.

(Continued on page 168)

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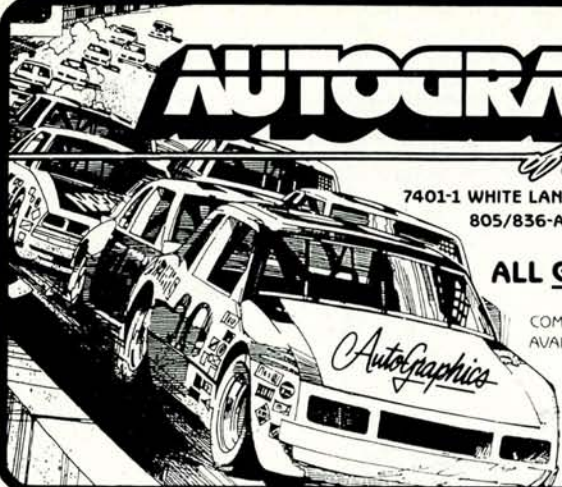
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DOUBLE DARE

(Continued from page 164)

Tekin Electronics, 970 Calle Negocio, San Clemente, CA 92672.

Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.

DuraTrax/Tower Hobbies, P.O. Box 4021, Champaign, IL 61820.

TRUCK PULLS

(Continued from page 85)

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● **2WD Open I:** This is where things start to get a little crazy, as the really exotic vehicles are unleashed! The chassis and gearbox may be scratch-built, with no limit on the gearbox; the wheelbase must not exceed a length of 24 inches; the maximum width is 14 inches; and the vehicle can weigh no more than 15 pounds. Up to 14 cells can be used.

Charles Allen, who won the NARCTPA Grand Nationals Supermodified Class, took the 1st spot by pulling 272 pounds for 29 feet, 8³/₄ inches. Flirtin' With Disaster (a Bennett Equipment Pro Puller) used the maximum 14 cells to power an Astro Flight 12T. The scratch-

(Continued on page 170)

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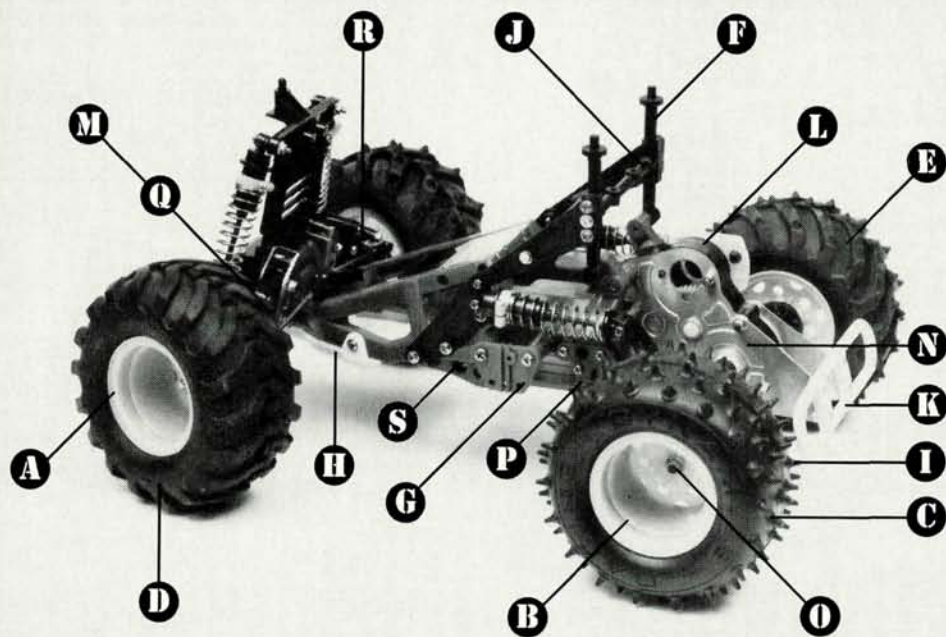
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(Continued from page 168)

built Ground Pounder of John Walters used a LeMans 360ST to come in 2nd

with a pull of 28 feet, 11³/₈ inches. With a Twister powerplant, Joe Kirkwood drove a C&S Wedge named Jomama to 3rd by pulling the sled 28 feet, 7³/₈ inches.

● **4WD Open I:** The victorious Triple


Threat—the Javelin driven by Dave Pennington—was the only vehicle to achieve a full pull in the three rounds, and it used a LeMans 360PT motor to move 138 pounds. After three pulls, John Sproul and Ralph Cox were tied, with pulls of 29 feet, 9½ inches, so a pull-off was necessary.

The Shake Me Optima of Ralph Cox (powered by a Kyosho Spa motor) went a distance of 21 feet, 7³/₄ inches to take 2nd. John Sproul's Hi-Lux, the Enforcer (which was featured in the February '89 issue of *RCCA*), came in 3rd, with a pull of 17 feet, 1¹/₂ inches, using a Black Magic motor.

● **2WD Open II:** Here's where you'll find ultimate horsepower! Up to four motors can be used, with a maximum of 28 cells! The maximum dimensions are stretched to a length of 28 inches and a width of 20 inches, with a top weight of 25 pounds. The officials really had to be on their toes!

Probably the most impressive vehicle in this class was the Silver Bullet—a scratch-built puller driven by Larry Jaques and John Dyke of St. Catharines, Ontario, Canada. Dyke had to slam on the brakes at the end of each run to prevent the Bullet from running into the officials' table, which was 15 feet from the end of the

(Continued on page 172)



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TRUCK PULLS

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track and separated from it only by a gymnastics floor mat! On one run, he had

so much speed that, when he stopped, the sled flipped and landed on the back of the Silver Bullet! Another run ended with the weights being flung out of the sled at the finish.

Gary Kmit, whose Custom R/C Puller, Mellow Yellow, was a little more manageable, was propelled by an Astro Flight 05 motor to 1st place, when his truck pulled the 350-pound sled 23 feet, 1 1/4 inches. The LeMans 360ST-powered, scratch-built Carpet Burner of John Walters was 2nd, going 18 feet, 4 1/8 inches. John Dyke came in 3rd. His Astro Flight Pullmaster motor was still going strong when electrical problems caused all the power to be sent to one wheel, forcing the Silver Bullet to flip off the left side of the track at the 10 foot, 8 1/4-inch mark. Whew!

• **4WD Open II:** Bennett equipment swept the top two spots, as Larry Bennett lugged 275 pounds to 29 feet, 10 1/8 inches using a Pro Puller and three Black Magic motors. The Farm Toy Pro Puller of Charles Allen, (using three Astro Flight 05 motors) wound up 2nd with a pull of 29 feet, 7 1/4 inches. Brian Sheler's Clod Buster—Bad Company—took the 3rd spot, using an Astro Flight motor and a Black Magic motor to pull the sled 21 feet, 6 1/4 inches.

Monster Might?!

Although there were 35 entrants spread

(Continued on page 174)

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10th&12th ONROAD 14-17 TURN

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Combo Package	269
RC10 Grph w/brgs	189
Combo Package	289
JRX2 Std w/brgs	179
Combo Package	279
Ultima w/brgs	109
Combo Package	209
Ult Turbo or Pro	189
Combo package	289
Optima Mid SE	239
Combo Package	339
Raider Std or ARR	89
Combo Package	189
Big Brute Truck	99
Combo Package	199
Double Dare 4WD	159
Combo Package	259
Blackfoot Truck	109
Combo Package	209
Royal Crusher	89
Combo Package	189

All Packages Include:

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- 7.2 Volt SC Battery
- Hobbico AC/DC Charger

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FUT Spt w/148	\$10
FUT Spt w/112B	45
FUT Jr w/148	35
FUT Jr w/132H	70
FUT Jr w/112B	75
Airtronics XL2P	35
7.2 Volt SCR	5
7.2 Volt SCE	15
Astro 114	10
Hobbico 905	15
Hobbico 910	20
Royal 702	10
Royal 701	15
Protech 702	15
Protech 701	25
Protech 707	40
Protech 700	55
Protech 706	65

ACCESSORIES

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Trinity, Revtech, Peak, B&R
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Any Comp Modif 59
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FUT 11B or 111B 84
Tekin 300 Std 79
Tekin 600 Pro 104
Novak T4 Std 79
Novak T1 Pro 119
(specify plug)

Futaba Pistol Radios:

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Sport w/112B 99
Junior w/148 94
Junior w/132H 134
Junior w/112B 134
Junior w/9601 159
2PD Mag w/132H 164

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TRUCK PULLS

(Continued from page 172)

over four classes, this competition was something of a disappointment. The carpet obstacle course, which was laid out on the gym floor, was only large enough to have timed runs by one truck at a time. Consequently, there was no head-to-head competition, so it wasn't too exciting to watch!

Even more frustrating was that monster truck conversion kits were allowed to compete with Blackfoots and Big Brutes in the 2WD Modified Class. There's no way these stock-configured trucks can keep up with the conversions! I was told that next year, the classes will be further divided.

In 2WD Stock, in which trucks had to use motors that cost less than \$30, John Stokes's Big Brute used a LeMans 240 ST to take 1st place with a run of 6.41 seconds. Ted Strandberg's LeMans 05-powered Clod Buster won the 4WD Stock Class in 7.90 seconds. Patrick Schwab took 1st in the 2WD Modified with an RC10 conversion. A Speedworks 350 powered his truck to a time of 5.42 seconds.

In the 4WD Modified Class, it seems the trucks had too much power, as their times were almost twice those of the 4WD Stocks. Mike Dozier harnessed the power of two Trinity motors to get his Clod Buster around the course in 12.59 seconds.

What's In Store?

Since there are a number of different classes, there's something for everyone in this sport. The emphasis on setting up the vehicles, and not on all-out madness, should keep pullers coming back year after year. With other club officers, NR/CTPA President Dave Sproul is trying to promote competition while keeping the focus on having a good time. I think most people did just that! ■

DIRT DIGEST

(Continued from page 88)

in the rear steering gear (and only the rear), and the method is simple.

The assembly manual shows the tie rod connected to the servo-saver at the center hole in its actuating arm. Instead, install the rod and its pivot ball in the outside hole. It's a small difference in distance, and you might not think that it's significant, but remember geometry (oh, no—not geometry, too!). While the angle

(Continued on page 176)

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DIRT DIGEST

(Continued from page 174)

formed by the rod and the servo-saver arm doesn't change significantly, the length of the hypotenuse (any line drawn between

the two legs of an angle; in this case, formed by the servo-saver arm and the tie rod) increases as you move away from the angle itself. That small difference measured at the servo-saver becomes a much larger distance by the time you've reached

the 52mm mark (or so) at the end of the tie rod. You'd be surprised at the difference it can make.

Double Dare Buster

Just a quick note to Double Dare owners. Your truck doesn't have a sufficiently wide wheel track (the distance across the front or back of the car as measured from the center of each tire tread). A few companies offer adapters for the Dare's drive nuts to make them accept Clod Buster wheels and tires. They might be just the ticket for you, but I haven't tried the conversion yet. If you do get the hub adapters, take a look at Imex's* dual tires as well. They use wheels of the same width as the original Clod Buster units, because the two tires are skinny. You get dualies without all that extra unsprung weight. (Clod owners take note also).

Next Month

Now that the CZ-R engine has arrived, I'm stuck reassembling my RS-200, and I found out that the drive shafts only have bushings installed. Kyosho recommends bearings for the high-revving CZ-R. Guess what? You'll find out all about doing that next month. I hope Bob will have run out of polyurethane by then (or

(Continued on page 194)

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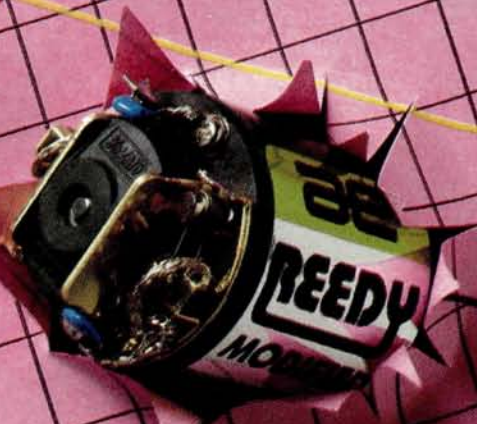
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DIRT DIGEST

(Continued from page 176)

spare cash!) and be back.

If you're having a problem, write in. Between us, we have 1/4-, 1/8-, 1/10- and 1/12-scale cars and a fleet of trucks, so we should be able to offer some advice.

*Here are the addresses of the manufacturers mentioned in this article:

MRC/Tamiya, 200 Carter Dr., P.O. Box 267, Edison, NJ 08818.

Aerotrend, 31 Nichols St., Ansonia, CT 06401.

APM Custom Hobby, Inc., P.O. Box 357, Dumont, NJ 07628.

ESP Manufacturing, 524 Woodland Dr., Crystal Lake, IL 60014.

Imex Model Co., 53 Trade Zone Ct., Ronkonkoma, NY 11779.

RS200

(Continued from page 103)

age. In went bearings and, at the same time, I pulled off the JG wheels and replaced them with those from a Polk's* Wildebeest.

I have the same basic complaint as when I did the Optima conversion: because they use the standard Blackfoot wheel offset, mounting the JG wheels on the adapters puts the entire weight of the wheel over the spindles, and this puts an extra load on the bushings (or bearings). The Wildebeest wheels are offset enough to shift the weight back over the knuckle.

JG has announced the introduction of

new wheels that can be mounted directly to the Kyosho drive washers, so the problem should soon be a thing of the past. As an alternative, you can use Bru-Line* Super System wheels (probably no. 4407 would be best, although there are a few other possibilities) with Kyosho hubs.

I spent the second afternoon making toe-in and camber adjustments, and I soon replaced the stock suspension and steering rod set with Du-Bro* adjustable 4-40 rods. They made fine-tuning the truck easy, to the point where it now has a 20-inch turning radius.

The third afternoon was a holiday of sorts: I just enjoyed myself while I ran the

(Continued on page 196)

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RS200

(Continued from page 194)

truck. The Diamond Pin Spike tires are exceptionally good on hard dirt, and it was great to listen to the .10 engine unwind and to watch the little puffs of dust thrown up by the tires. I even tried to roll the truck by taking some turns really fast,

but its inner wheels lifted only slightly before it settled back down. This is *real* satisfaction. It's almost as fast as a Stinger and as stable as Clod Buster.

What's Next?

A truck conversion is never easy. With the body now mounted high, the shaft drive and front and rear differential belts

are exposed to dust and dirt, and they'll need more frequent attention. Going off-road also means checking all the screws and nuts after each run to make sure they're still tight after the pounding and vibration they've endured. (One of the kingpins had actually backed halfway out by the end of the third day's runs.)

(Continued on page 199)

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Patent Disclosure Document Submitted

RS200

(Continued from page 196)

Of course, there's also room for further modifications. A different engine is definitely in order (probably a .12 CZ-R for speed, if you stick with the relatively small-diameter JG tires). If you want some pulling fun, there should still be some O.S. .12 4-stroke engines available for power.

For my conversion, the Diamond Spikes have already been changed in favor of Imex* Truck-Pull tires that are larger and give the conversion a more realistic crush-truck appearance. One result of the increased tire size was that the front bumper needed to be trimmed down to prevent tire interference during full lock-to-lock steering. Using Bru-Line's Super System wheels, it should even be possible to mount Clod Buster tires. Whether or not the engine and the drive train will stand the strain is entirely another matter. At the very least, you'd want to get a clutch bell with a smaller gear (12-, 13-, and 14-tooth are optional).

Of course, with all these modifications, the conversion will cost more than a stock Nitro Brute, and it will be a little more fragile; but that's one of the chances you

take in the monster world. It's just a matter of going for broke.

*Here are the addresses of the companies mentioned in this article:

Kyosho/Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.

JG Manufacturing, P.O. Box 6014, Whittier, CA 90609.

O.S./Great Planes Model Distributors.

Aristo-Craft/Polk's, 346 Bergen Ave., Jersey City, NJ 07304.

Bru-Line Industries, Inc., P.O. Box 3786, Center Line, MI 48015.

Du-Bro Products, 480 Bonner Rd., Wauconda, IL 60084.

Imex Model Co., 663 Townline Rd., Hauppauge, NY 11788.

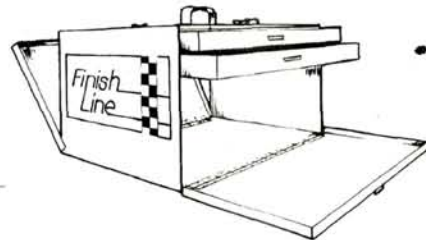


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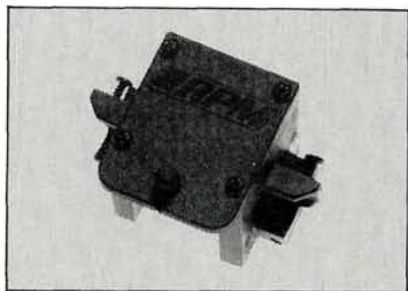
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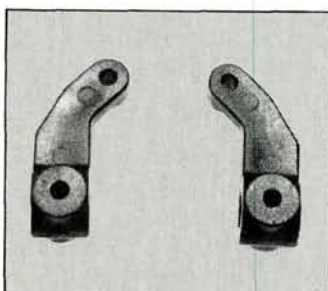
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In keeping with our constant efforts to help foster the growth of the radio-control car hobby, we've decided to run this track directory intermittently to inform modelers where they can race and exchange ideas. If you'd like your track listed, send us your name, address, phone number and some information about the track to *R/C Car Action Track Directory*, 251 Danbury Road, Wilton, CT 06897. We'll list as many clubs as space allows.

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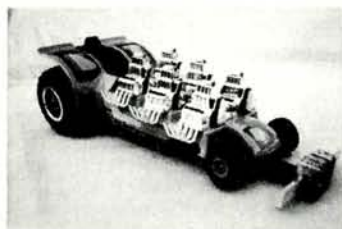


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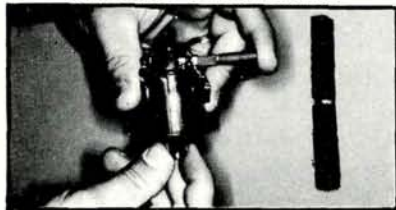
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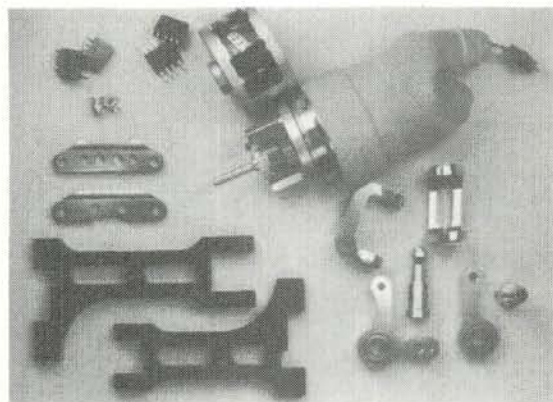
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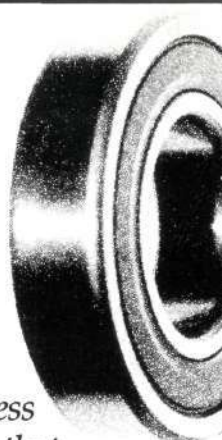
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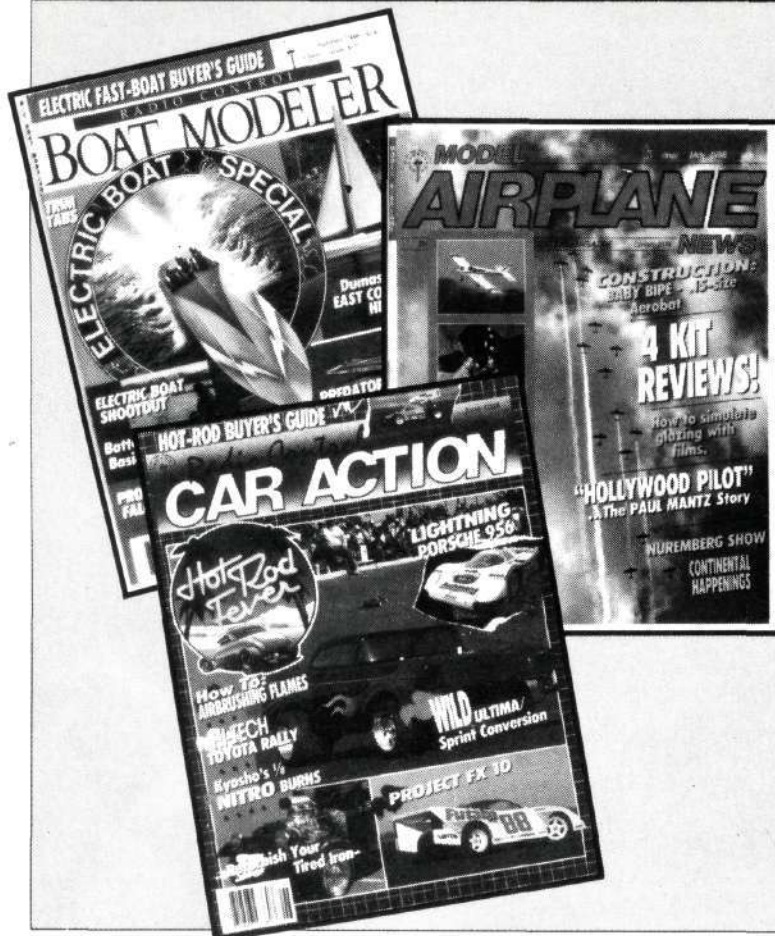
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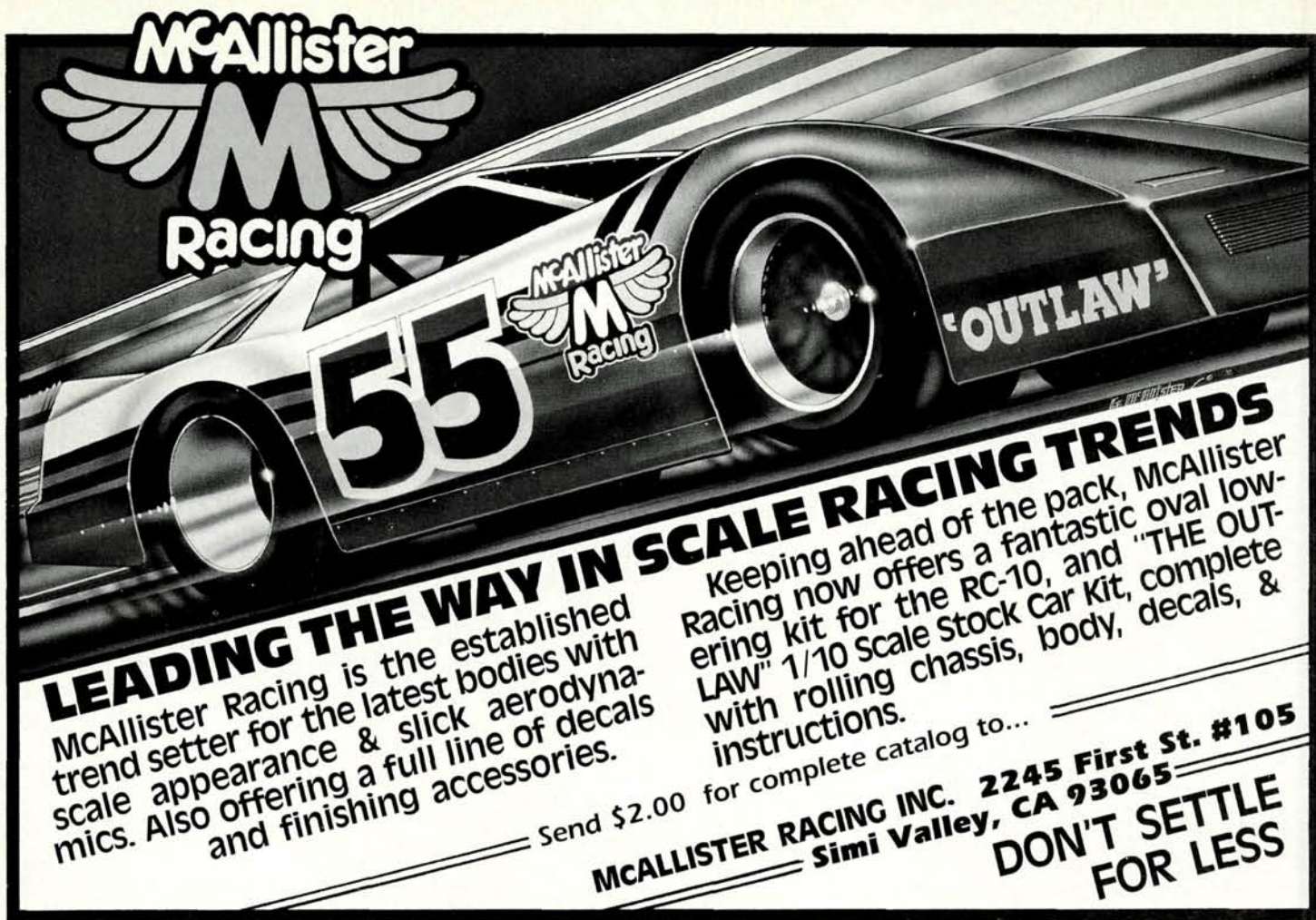
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